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IN

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CONTENTS.

	PAGE
1. THE SIXTY-YEAR CYCLE OF JUPITER, by Professor F. KIELHORN, C.I.E.	193
2. INSCRIPTIONS OF THE KINGS OF CHEDI, by Professor F. KIELHORN, C.I.E.	209
MISCELLANEA :—	
3. CORPUS INSCRIPTIONUM INDICARUM, Vol. III., by J. F. FLEET	219
4. A NEW SYSTEM OF THE SIXTY-YEAR CYCLE OF JUPITER, by J. F. FLEET	221
5. ONOMATOPŒIA IN HINDUSTANI, by J. G. DELMERICK	224

Plate :—

Bengal Asiatic Society's Plate of Chandradéva and Madanapáladéva; the year 1154 ..... *to face* p. 19

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Catalogue of Hindustani Printed Books in the Library of the British Museum; by J. F. Blumhardt. 1889.

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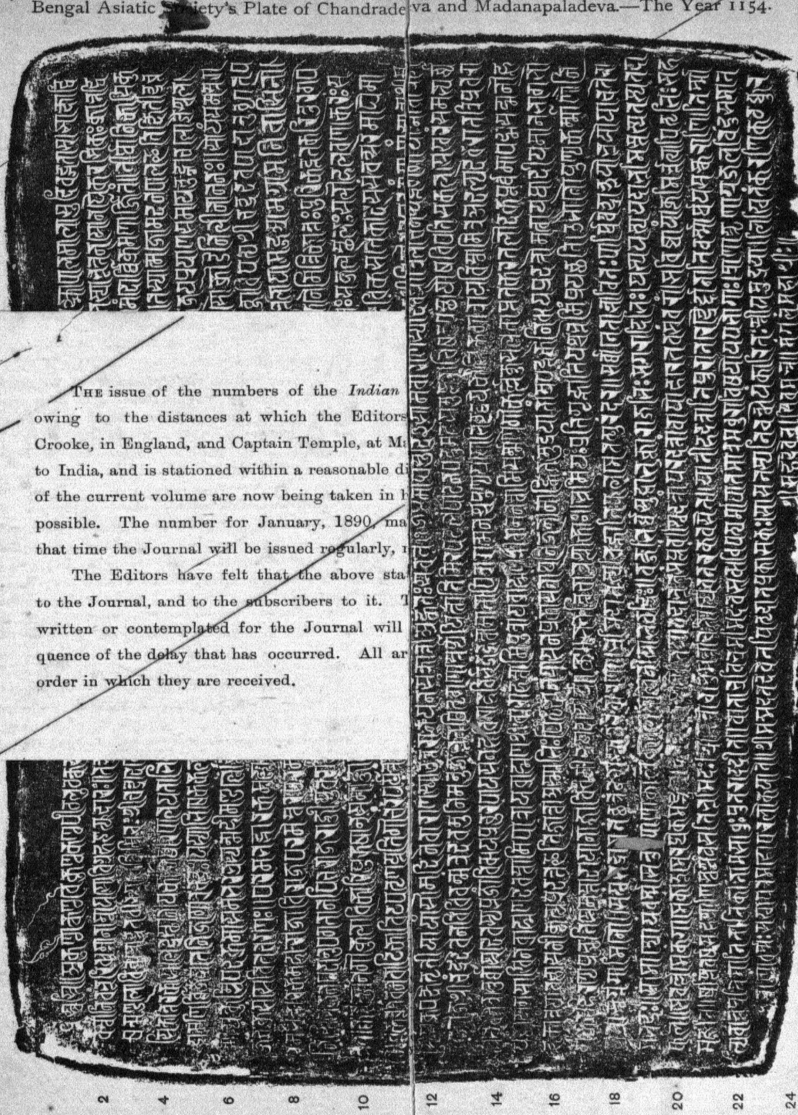

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J. F. FLEET, BO. C.S.

SCALE ·42

W. GRIGGS, PHOTO-LITH.

THE SIXTY-YEAR CYCLE OF JUPITER.

BY PROFESSOR F. KIELHORN, C.I.E.; GÖTTINGEN.

WHILE engaged in calculating or verifying Hindu dates in which the year of one era or another is coupled with a year of the Sixty-Year Cycle of Jupiter, I have had frequent occasion to resort to the third memoir of Warren's invaluable *Kâla-Saṅkalita*, pp. 197-216, and I have often admired the ingenuity and clearness with which that great scholar has treated his subject. At the same time, I cannot but confess that the use of Warren's Tables is somewhat troublesome; and it has appeared to me that the process of finding the exact beginning and end of a cycle-year, according to the different rules, might be simplified by giving certain fractions of days, etc., in decimals of days, and by expressing the epochs of the several eras, as well as other items, in days of the Julian period, a method which has been followed successfully by Dr. Schram in his *Hilfstafeln für Chronologie*.[1] Besides, Warren's book is now difficult to obtain. The following simple rules and Tables may therefore not be altogether unwelcome to scholars who either do not possess a copy of the *Kâla-Saṅkalita* themselves, or have no large public library within easy reach.

A.—The beginning and end of the Cycle-year according to the Sûrya-Siddhânta.

(*a*)—According to the *Sûrya-Siddhânta*, the epoch of the Kaliyuga, expressed in days of the Julian period, and in such a manner as to yield current days and hours, etc., after mean sunrise (at Ujjain), in the final results, is —

588 465·7500 days.[2]

(*b*)—The length of one solar year is—

365·2587565 days.[3]

(*c*)—The length of one year of Jupiter's cycle, without Bîja or correction, is —

361·02672103 days.

(*d*)—The length of one year of Jupiter's cycle, with Bîja or correction, is —

361·0346511 days.

Rules.

1. To find the beginning of any year of the Kaliyuga, in accordance with the *Sûrya-Siddhânta*, multiply (*b*), i.e. the length of one solar year, by the number of years expired, and to the product add 588 463·6024 (i.e. the epoch of the Kaliyuga diminished by 2·1476, the time by which the apparent Mêsha-saṅkrânti at the commencement of the Kaliyuga, according to Warren, preceded the epoch). Convert the result into the European date by Tables I. and II.

Thus, for the beginning of Kaliyuga 4871, current, we find—

$$\begin{array}{r} 365{\cdot}2587565 \times 4870 \\ \hline 1778\ 810{\cdot}1441550 \\ +\ 588\ 463{\cdot}6024 \\ \hline 2367\ 273{\cdot}7466 \end{array}$$

days of the Julian period, which by Tables I. and II. correspond to

9th April, A.D. 1769, new style, 17 h. 55·1 m.

In other words, the solar year Kaliyuga 4871, current, according to the *Sûrya-Siddhânta*, commenced 17 h. 55·1 m. after mean sunrise (at Ujjain) of 9th April, A.D. 1769, new style.

[1] That portion of Dr. Schram's work which has reference to the Hindu luni-solar calendar, has now been re-cast by the author, and will be published in a following number of this Journal. Dr. Schram's Table for converting a day of the Julian period into the European date, (the use of which will appear from the examples given at the end of this article) is, for the sake of ready reference, by the author's permission, appended also to the present paper (Table I.).

[2] i.e. midnight between the 17th and 18th February, 3102 B.C.

[3] These figures (*b*), (*c*), and (*d*) are based on the following data:—The number of civil days in a Mahâyuga is 1577917828; in the same period there are 4320000 revolutions of the sun; revolutions of Jupiter (without correction) 364220; and revolutions of Jupiter, as corrected by the Bîja, 364212.

2. To find the end of any one year of Jupiter's cycle, without or with Bîja, multiply either (*c*), *i.e.* the length of one cycle-year without Bîja, or (*d*), *i.e.* the length of one cycle-year with Bîja, by the number which that particular year holds in the series of Jupiter's years counted from the beginning of the Kaliyuga (and which, as will be shown under 3, below, in practice can be readily ascertained), and to the product add (*n*), *i. e.* the epoch of the Kaliyuga. Convert the result into the European date by Tables I. and II., as before.

Thus, assuming a year Vilamba to be the 4926th of Jupiter's years, counted from the commencement of the Kaliyuga, we find—

(*a*) for the end of Vilamba without Bîja :—

361·02672103 × 4926
1778 417·62779378
+ 588 465·7500
2366 883·3778 days of the Julian period, which by Tables I. and II. correspond to

15th March, A.D. 1768, new style, 9 h. 4 m.

In other words, the year Vilamba without Bîja ended (and the following year Vikârin commenced) 9 h. 4 m. after mean sunrise (at Ujjain) of 13th March, A.D. 1768, new style.

(*b*) for the end of Vilamba with Bîja :—

361·0346511 × 4926
1778 456·6913186
+ 588 465·7500
2366 922·4413 days of the Julian period, which by Tables I. and II. correspond to

23rd April, A.D. 1768, new style, 10 h. 35·5 m.

In other words, the year Vilamba with Bîja ended (and the following year Vikârin commenced) 10 h. 35·5 m. after mean sunrise (at Ujjain) of 23rd April, A.D. 1768, new style.

Having found the end of Vilamba, we find the commencement of Vilamba by deducting the length of one cycle-year, without or with Bîja, as the case may be, thus :—

end of Vilamba without Bîja, 2366 883·3778
less one year without Bîja, — 361·0267
remainder 2366 522·3511,

i.e. 20th March, A.D. 1767, new style, 8 h. 25·6 m., — beginning of Vilamba without Bîja;

end of Vilamba with Bîja, 2366 922·4413
less one year with Bîja, — 361·0347
remainder 2366 561·4066,

i.e. 28th April, A.D. 1767, new style, 9 h. 45·5 m., — beginning of Vilamba with Bîja.

3. How to find the number of any year of Jupiter, mentioned in a date, in the series of Jupiter's years counted from the commencement of the Kaliyuga, may be best shown by two examples :—

First Example.

An inscription on a Satî-pillar at 'Boram-Dêo' in the Central Provinces, (*Archæol. Survey of India*, Vol. XVII. Plate xxii.) is dated—

Saṁvat 1445 **Bhâva**-nâma-saṁvasa(tsa)rê Âsvi(śvi)na-sudi 13 Sômê ;

i.e. 'the (Vikrama) year 1445, in (Jupiter's) year named **Bhâva**, the 13th of the bright half of Âśvina, on Monday ;' — and the corresponding European date (for the northern expired Vikrama year 1445) is Monday, 14th September, A.D. 1388, when the 13th *tithi* of the bright half ended 19 h. after mean sunrise.

The question here is : — Which year of Jupiter, counted from the commencement of the Kaliyuga, was the year **Bhâva** (the 42nd year in the Sixty-Year Cycle, when counted from Vijaya as No. 1 ; see Table III.), which is mentioned in this date ?

To answer this question, we substitute for the Vikrama year (1445) of the date the corresponding year of the Kaliyuga (4489), obtained by adding 3044; this year of the Kaliyuga (4489) we divide by 85; and we add the quotient to the dividend, counting fractions exceeding $\frac{1}{2}$ as 1, thus (4489 divided by 85 = 52 $\frac{29}{85}$ = 53; 4489 + 53 = 4542); dividing the sum (4542) by 60, the remainder will be, approximately, the number which the year we are concerned with holds in the Sixty-Year Cycle, when counted from Vijaya as No. 1; (4542 divided by 60 leaves remainder 42). Where the remainder actually corresponds with the number of the year of the date in the Sixty-Year Cycle, counted from Vijaya, (as is the case in the present instance), the sum previously divided by 60 (here 4542), is the very number sought (here 4542). But where the remainder falls below or exceeds that number (which would have been the case here if the remainder had been 41 or 44), the difference (in the assumed case, either 1 or 2) must be either added to, or subtracted from, the sum (here 4542) divided by 60 (in which case the year sought would have been either 4543 or 4540, respectively).[4]

In the present date, then, Bhâva was the 4542nd year of Jupiter from the commencement of the Kaliyuga; and we now find, by the rule given under 2, —

(*a*) for the end of Bhâva without Bîja :—

```
     361·02672103 × 4542
  1639 783·36691826
+ 588 465·7500
  2228 249·1169, i.e. 12th August, A.D. 1388, 2 h. 48·3 m.;
```

(*b*) for the end of Bhâva with Bîja :—

```
     361·0346511 × 4542
  1639 819·3852962
+ 588 465·7500
  2228 285·1353, i.e. 17th September, A.D. 1388, 3 h. 14·8 m.
```

The result is, that the year Bhâva, whether without or with Bîja, was current at the commencement of the solar year Kaliyuga 4489 (= V. 1445) expired; and that, with Bîja, it actually included the day (the 14th September, A.D. 1388) which is mentioned in the inscription.

Second Example.

My manuscript of the *Kâśikâ-Vṛitti* is dated —

Saṁvat 1464 varshê Âshâḍha-vadi tritîyâyâṁ tithau Manmatha-saṁvatsarê Budhê; *i.e.* 'in the (Vikrama) year 1464, on the third lunar day of the dark half of Âshâḍha, in (Jupiter's) year Manmatha, on Wednesday.'

Here it so happens that, had the year Manmatha not been mentioned in the date, the corresponding European date might be either, —

for the northern expired Vikrama year 1464, by the *pûrṇimânta* reckoning, Wednesday, 25th May, A.D. 1407, when the third *tithi* of the dark half ended 5 h. 10 m. after mean sunrise; or —

for the southern expired Vikrama year 1464, by the *amânta* reckoning, Wednesday, 11th July, A.D. 1408, when the third *tithi* of the dark half ended 11 h. 12 m. after mean sunrise.

In fact, the question as to which of these two dates is the date on which the writing of my MS. was finished, must and can only be decided by the year Manmatha.

Manmatha is the 3rd year of the Sixty-Year Cycle, counted from Vijaya; and proceeding as before, we have: — Vikrama 1464 + 3044 = Kaliyuga 4508; 4508 divided by 85 = $53\frac{43}{85}$; 4508 + 53 = 4561; 4561 divided by 60 leaves remainder 1; this being 2 less than Manmatha

[4] It will be clear from the above that, the first thing to do, is always to substitute for the year of the date the corresponding year of the Kaliyuga; and in this respect it makes no difference whatever whether, the Vikrama year of a date is a northern or southern year. Should the year of the date be a Śaka year, we should also first substitute the corresponding year of the Kaliyuga, obtained by adding 3179; and we should proceed similarly in the case of any other era.

(3), we have 4561 + 2 = 4563 as the number (from the commencement of the Kaliyuga) of the year Manmatha of our date. We now find —

(*a*) for the end of Manmatha without Bija :—

```
        361·02672103 × 4563
      1647 364·92805989
    + 588 465·7500
      2235 830·6781, i.e. 15th May, A.D. 1409, 16 h. 16·5 m.;
```

and for the beginning of Manmatha without Bija, by deducting one year without Bija :—

```
      2235 830·6781
        — 361·0267
      2235 469·6514, i.e. 19th May, A.D. 1408, 15 h. 38 m.
```

(*b*) for the end of Manmatha with Bija :—

```
        361·0346511 × 4563
      1647 401·1129693
    + 588 465·7500
      2235 866·8630, i.e. 20th June, A.D. 1409, 20 h. 42·7 m.;
```

and for the beginning of Manmatha with Bija, by deducting one year with Bija :—

```
      2235 866·8630
        — 361·0347
      2235 505·8283, i.e. 24th June, A.D. 1408, 19 h. 52·8 m.
```

The year Manmatha, without Bija, therefore lasted from—

19th May, A.D. 1408, 15 h. 38 m., to 15th May, A.D. 1409, 16 h. 16·5 m.; and the same year, with Bija, from —

24th June, A.D. 1408, 19 h. 52·8 m., to 20th June, A.D. 1409, 20 h. 42·7 m.; and it is clear that of the two otherwise possible European equivalents of the Hindu date (Wednesday, 25th May, A.D. 1407, and Wednesday, 11th July, A.D. 1408) only the second can be the true date, because only this date falls in the year Manmatha.

4. It is apparent that the above rules may be combined to ascertain or verify the occasion of a kshaya or expunged year of Jupiter. Thus it may be shown that Subhakṛit, the 10th year of the cycle, counted from Vijaya (inclusive), with Bija, was such a year in Kaliyuga 4873, current. By the above we find that Kaliyuga 4872 ended, and Kaliyuga 4873 began —

```
        365·2587565 × 4872
      1779 540·6616680
    + 588 463·6024
      2368 004·2640680, i.e. 10th April, A. D. 1771, new style, 6 h. 20·3 m.;
```

and that Kaliyuga 4873 ended —

```
      2368 004·2640680
    + 365·2587565
      2368 369·5228, i.e. 9th April, A.D. 1772, new style, 12 h. 32·8 m.
```

We also find that (since Subhakṛit in Kaliyuga 4873 must have been the 4930th year of Jupiter from the commencement of the Kaliyuga) Subhakṛit with Bija commenced, or the preceding year Plava (4929) ended —

```
        361·0346511 × 4929
      1779 539·7952719
    + 588 465·7500
      2368 005·5452719, i.e. 11th April, A.D. 1771, new style, 13 h. 5·2 m.;
```

and that Subhakṛit with Bija ended —

2368 005·5452719
+ 361·0346511
2368 366·5799, *i.e.* 6th April, A.D. 1772, new style, 13 h. 55·1 m.

It is therefore clear that Subhakṛit, since it commenced after the beginning of Kaliyuga 4873 current, and ended before the end of Kaliyuga 4873 current, *was* a *kshaya* or expunged year in 4873. And by deducting the sum of days for the commencement of Kaliyuga 4873 from the sum of days for the commencement of the year Subhakṛit, we find that the commencement of Subhakṛit with Bija was due 1 day, 6 h. 44 m. 54 *s.* after the commencement of Kaliyuga 4873 current.

5. **By Warren's Rules and Tables** the Jupiter's years will be found to begin and end about 2·1476 days, = 2 days 3 h. 32 m. 30 s., earlier than by the above rules. Thus, according to the *Kâla-Saṁkalita*, p. 201, the commencement of the year Vikârin (or the end of Vilamba), with Bija (above, 2), fell on 21st April, A.D. 1768, new style, instead of falling on the 23rd April; and the solar time of Vikârin expired, at the commencement of Kaliyuga 4871 current, according to Warren, was —

353 days 27 d. 10 p. 31·0640 c., *i.e.* about 353 days 10 h. 52·2 m. = 353·4529 days, whereas by my rule it was only 351·3053 = (353·4529 — 2·1476) days. Similarly, by Warren's Tables, the year Bhâva, with Bija, (above, 3, *First Example*), would end on the 14th September, A.D. 1388, 23 h. 42·2 m., whereas by my rule it ended on the 17th September, A.D. 1388, 3 h. 14·8 m., *i.e.* 2 days 3 h. 32·6 m. later. And according to the *Kâla-Saṁkalita*, p. 206, Plava, with Bija, was an expunged year in Kaliyuga 4872, current, while by the above rules Subhakṛit was an expunged year in Kaliyuga 4873, current.

The reason of this difference is that Warren has calculated the Jupiter's years from the apparent Mêsha-saṁkrânti at the commencement of the Kaliyuga, whereas they should have been calculated from the mean Mêsha-saṁkrânti or the vulgar epoch of the Kaliyuga, which, according to Warren, was 2·1476 days later than the apparent Mêsha-saṁkrânti. **This important correction I owe in the first instance to Mr. Sh. B. Dikshit,** and I have found Mr. Dîkshit's remarks on the subject confirmed by the practice of four MS. calendars in the Royal Library at Berlin. Thus, to give only one instance, in a calendar for the expired northern Vikrama year 1841 we read :—

Saṁvat 1841 Śakê 1706 . . . . . Râkshasa-nâma-saṁvatsara-pravṛittiḥ | Tasya guru-mânêna mêshât prâg bhukta-mâsâdi 3 2 33 36 | ;

i.e., at the commencement of the (expired) Vikrama year 1841 or the (expired) Saka year 1706 (= Kaliyuga 4885, expired), the Jupiter's year current is **Râkshasa** (the 4943rd year from the commencement of the Kaliyuga); and of this year there have elapsed at the time of the Mêsha-saṁkrânti (of Kaliyuga 4885 expired) 3 months, 2 days, 33 daṇḍas, 36 palas, = 92·5600 days, of Jupiter's own time.

By my own rules, we have —

end of Kaliyuga 4885, current, = 2372 752·6279
— beginning of Râkshasa, without Bija, = 2372 659·8053
remainder 92·8226;

i.e., the beginning of the year Râkshasa, without Bija, preceded the commencement of Kaliyuga 4885, expired, by 92·8226 solar days. To convert these into days of Jupiter's own time, say, as 361·0267 solar days (the length of the Jupiter's year without Bija) to 360 days of Jupiter's own time, so are 92·8226 solar days to 92·5586 days of Jupiter's own time. Deducting 92·5586 from 92·5600, the remainder will be 0·0014 days = 2 minutes, by which the year Râkshasa, according to my rule, will commence later than it does according to the MS. calendar. According to Warren, the commencement of Râkshasa, without Bija, would precede the commencement of Kaliyuga 4885, expired, by about 94·9721 solar days, *i.e.* Râkshasa would commence about 2 days 3 h. 33·3 m. earlier than it is made to begin by the MS. calendar.

B.—The beginning and end of the Cycle-year according to the Jyôtistattva.

(*a*)—According to the *Arya-Siddhânta*, the epoch of the Saka era, expressed in days of the Julian period, and in such a manner as to yield current days and hours, etc., after mean sunrise (at Ujjain), in the final results, is —

1749 621·1979 days.

(*b*)—The length of one solar year is —

365·25868055 days.

Rules.

1. To find the beginning of any year of the Saka era, in accordance with the *Arya-Siddhânta*, multiply (*b*), *i.e.* the length of one solar year, by the number of years expired, and to the product add (*a*), *i.e.* the epoch of the Saka era. Convert the result into the European date by Tables I. and II.

Thus, for the beginning of Saka 1680, current, we find—

$$\begin{array}{r} 365\cdot25868055 \times 1679 \\ \hline 613\ 260\cdot32464345 \\ +\ 1749\ 621\cdot1979 \\ \hline 2362\ 890\cdot5225 \end{array}$$

i.e. 9th April, A.D. 1757 new style, 12 h. 32·4 m., which differs by six seconds from the commencement of Saka 1680, current, as given in Warren's First Chronol. Table, p. xxiv.

And similarly, for the beginning of Saka 1311 expired (or 1312 current) we find—

$$\begin{array}{r} 365\cdot25868055 \times 1311 \\ \hline 478\ 854\cdot13020105 \\ +1749\ 621\cdot1979 \\ \hline 2228\ 475\cdot3281 \end{array}$$

i.e. 26th March, A.D. 1389, 7 h. 52·5 m. which agrees to the very second with the result obtained from Warren's Table XLVIII., Second Part.

2. The Jyôtistattva rule yields, for the commencement of any expired Saka year, the last *expired* Jupiter's year; and since it furnishes the means of determining what portion of the current Jupiter's year had elapsed at the commencement of the said Saka year, it enables us to calculate accurately the moment when the last expired Jupiter's year ended or the current one commenced. The rule is given by Davis (*Asiat. Res.* Vol. III. p. 214) and Warren (*Kâla-Sankalita*, p. 202), as follows:—

"The Saka year note down in two places. Multiply (one of the numbers) by 22. Add (to the product) 4291. Divide (the sum) by 1875. The quotient (its integers) add to the second number noted down, and divide (the sum) by 60. The remainder or fraction will show the year last expired, counting from Prabhava (inclusive) as the first of the cycle. The fraction, if any, left by the divisor 1875, may be reduced to months, days, etc., expired of the current [Jupiter's] year."

Applying this rule, *e.g.* to the expired Saka year 1311, we find—

$$\frac{1311 \times 22 + 4291}{1875} = 17\ \tfrac{1359}{1875};\ \text{and}\ \frac{1311 + 17}{60} = 22\ \tfrac{8}{60}.$$

Here the numerator of the second fraction $\left(\frac{8}{60}\right)$ shows that at the beginning of Saka 1311, expired, the last expired year of Jupiter was the 8th, counted from Prabhava (inclusive), *i.e.* Bhâva. And the first fraction $\left(\frac{1359}{1875}\right)$ indicates that the end of Bhâva occurred $\frac{1359}{1875}$ of one solar year[5]

[5] This may be seen from the fact that 1875 reduced to days by Table IV. yields one solar year (in accordance with the *Arya-Siddhânta*) :—

1000 = 194·80453 days.
800 = 155·84362 „
70 = 13·63633 „
5 = 0·97402 „
1875 = 365·25867 days.

before the commencement of Śaka 1311, expired, (or the end of Śaka 1311, current). This fraction may be reduced to days by my Table IV. (which is based on Warren's Tables XIV. and XVI.), as follows:—

numerator	1000	=	194·80463 days.
"	200	=	38·96093 "
"	50	=	9·74023 "
"	8	=	1·55844 "
	$\frac{1258}{1876}$	=	245·06423 days.

And deducting this amount from the commencement of the expired Śaka year (which in the present instance has been found already under 1), we find exactly when the year Bhâva ended, or, which is the same, when the following year Yuvan began:—

Śaka 1311 expired	2228	475·3281
	—	245·0642
remainder	2228	230·2639,

i.e. 24th July, A.D. 1388, 6 h. 20 m.,—end of Bhâva or commencement of Yuvan.

Or, to give another example (*Kâla-Saṅkalita*, p. 203), for the commencement of Śaka 1 current, = Śaka 0 expired, we find—

$\frac{0 \times 29 + 4391}{1876} = 2\ \frac{641}{1876}$; and $\frac{0+2}{60} = 0\ \frac{2}{60}$; *i.e.* Jupiter's year expired 2 = Vibhava.

And numerator	500	=	97·40231 days;
"	40	=	7·79218 "
"	1	=	0·19480 "
	$\frac{641}{1876}$	=	105·38929 days;

i.e., at the commencement of the Śaka year 1 current, there had elapsed of the current Jupiter's year 3 = Śukla, 105 days 9 h. 20·6 m., which agrees with Warren's result to the very second;[6] and the year Śukla began—

epoch of Śaka era	1749	621·1979
	—	105·3893
remainder	1749	515·8086,

i.e. 19 h. 24·4 m. after mean sunrise (at Ujjain) of 29th November, A.D. 77.

3. The working of the Jyôtistattva rule shows that, according to the rule, the length of the ordinary Jupiter's year is $\frac{1933}{1876}$ of a solar year, *i.e.* 360·9730 (or, more accurately, 360·972978706) days; and, having found the end of one Jupiter's year, we therefore find the beginning of the same year, or the end of the following year, by simply either deducting that amount from, or adding it to, the number of days previously found (without starting afresh from the preceding or following Śaka year). For instance, —

end of Bhâva (under 2)	2228	230·2639
	—	360·9730
remainder	2227	869·2909,

[6] In a note on pp. 203 and 204 Warren has shown by an elaborate calculation that, by the Sûrya-Siddhânta rule, there had elapsed of the year Śukla, at the end of Kaliyuga 3179 or the commencement of Śaka 1 current — 70 days 8 d. 56 p. 30·0865 *c.* = 70 days 3 h. 34 m. 35*s.* = 70·1490 days.

As the year Śukla (the 37th year of the cycle, when counted from Vijaya) in Kaliyuga 3179 was the 3217th year, and the preceding year Vibhava the 3216th year of Jupiter, from the commencement of the Kaliyuga, we find—

end of Kaliyuga 3179	= 1749 621·1893
less end of Vibhava	= 1749 553·1878
remainder	68·0015;

i.e. the end of Vibhava or commencement of Śukla preceded the end of Kaliyuga 3179 really by only 68·0015 days (or by 2·1475 days less than was found by Warren).

i.e. 29th July, A.D. 1387, 6 h. 5·89 m., — beginning of Bhâva;

end of Bhâva (under 2)	2228	230·2639
+		360·9730
sum	2228	591·2369,

i.e. 20th July, A.D. 1389, 5 h. 41·1 m., — end of Yuvan.

And in a similar manner it would be possible, without starting a new calculation, to ascertain the end of any previous or subsequent year (as will be shown below, *not separated* from the year the end of which has already been found, *by an expunction*), by either subtracting or adding one ordinary Jupiter's year multiplied by the difference in the Sixty-Year Cycle between the year the end of which we know and the year the end of which we wish to find. For instance, given the end of Bhâva (No. 8), we find the end of the year Târaṇa (No. 18), by adding 360·9730 (or 360·97298) × 10, thus:—

end of Bhâva	2228	230·2639
+ (360·97298 × 10) =	3	609·7298
sum	2231	839·9937,

i.e. 11th June, A.D. 1398, 23 h. 50·9 m., — end of Târaṇa (No. 18).

4. Were we to calculate the Jupiter's years, *e.g.*, for the expired Śaka years 60 and 61, the result would be as follows:—

$$\frac{60 \times 22 + 4291}{1875} = 2\ \tfrac{1861}{1875}, \text{ and } \frac{60+3}{60} = 1\ \tfrac{3}{60};$$

$$\frac{61 \times 22 + 4291}{1875} = 3\ \tfrac{8}{1875}, \text{ and } \frac{61+3}{60} = 1\ \tfrac{4}{60}.$$

Here the numerators of the second fractions ($\frac{3}{60}$ and $\frac{4}{60}$) tell us that, at the commencement of Śaka 60 expired, the Jupiter's year last expired was No. 2 = Vibhava, and the Jupiter's year current was No. 3 = Śukla; and that, at the commencement of Śaka 61 expired, the Jupiter's year last expired was (*not* No. 3, but) No. 4 = Pramôda. The year Pramôda accordingly commenced after the beginning of Śaka 60 expired; and since it ended before the close of the same year, it was a **kshaya or expunged year.** And from the first fractions ($\frac{1861}{1875}$ and $\frac{8}{1875}$) we see that the duration of the year preceding the expunged year amounted to exactly one solar year, as may also be clearly demonstrated by the following figures:—

Numerator 1861 by Table IV. ..... =		362·53141
" 8 " " " ..... =		1·55844
Beginning of Śaka 60 expired ..... =	1771	536·71873
deduct for $\frac{1861}{1875}$		— 362·53141
End of No. 2 = Vibhava ...	1771	174·18732
Beginning of Śaka 61 expired..... =	1771	901·97741
deduct for $\frac{8}{1875}$		— 1·55844
End of No 4 = Pramôda ...	1771	900·41897
deduct for end of No. 2 = Vibhava. —	1771	174·18732
remainder.....		726·23165 days;
which is made up of one solar year... =		365·25868
+ one ordinary Jupiter's year..... =		360·97297
sum		726·23165 days.

With the above data, and assuming the occasions of expunged years to be known,[7] we might now of course calculate the end of any of Jupiter's years whatever, taking as our basis the end of any one year which may happen to be already known to us. For instance, the end of the

[7] Expunged years fell within the expired Śaka years 60, 145, 231, 316, 401, 486, 571, 657, 742, 827, 912, 998, 1083, 1168, 1253, 1339, 1424, 1509, 1594, 1679, 1765.

year Bhâva, which precedes Śaka 1311 expired, being known, we find the end and value of the Jupiter's year immediately preceding the present year, Śaka 1811 expired, thus:—

(Śaka 1311), end of Bhâva	2228 230·2639
(Śaka 1811—1311 =) 500 ordinary Jupiter's years . .	180 486·4888
6 solar years, for six expunctions between Śaka 1311 and 1811	2 191·5521
sum	2410 908·3048;

i.e. 27th September, A.D. 1888, new style, 7 h. 18·9 m., — end of the Jupiter's year which preceded the commencement of Śaka 1811 expired. And since Bhâva was the 8th year of the cycle, the year, the end of which we have thus ascertained, is $(8 + 500 + 6 = \frac{514}{60} = 8\frac{34}{60})$ Śarvarin, the 34th year of the cycle.[8]

C.—The Bṛihat-Saṁhitâ rule.

The Bṛihat-Saṁhitâ rule (Kern's translation, *Jour. As. Soc.*, N. S., Vol. V. p. 48, agrees with the Jyôtistattva rule, except that, — instead of multiplying by 22, adding 4291, and dividing by 1875, — we are directed to multiply by 44, to add 8589, and to divide by 3750. Applying this rule to the Śaka year 1311 expired, we find:—

$$\frac{1311 \times 44 + 8589}{3750} = 17\frac{2523}{3750}, \text{ and } \frac{1311 + 17}{60} = 22\frac{8}{60}.$$

The fraction $\frac{2523}{3750}$, being equal to $\frac{1261\frac{1}{2}}{1875}$, is converted into days by Table IV. as follows:—

numerator 1000	=	194·80463 days;
" 200	=	38·96093 "
" 60	=	11·68828 "
" 1	=	0·19480 "
" $\frac{1}{2}$	=	0·09740 "
$\frac{1261\frac{1}{2}}{1875} = \frac{2523}{3750}$	=	245·74604 days.

Deducting this amount from the commencement of

Śaka 1311 expired =	2228 475·3281
	— 245·7460
we obtain	2228 229·5821,

i.e. 23rd July, A.D. 1388, 13 h. 58·2 m., for the end of Bhâva or commencement of Yuvan, according to the Bṛihat-Saṁhitâ rule.

In other words, the Jupiter's year, by this rule, ends earlier than it does by the Jyôtistattva

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[8] Calculating in the ordinary way, we have—

$$\frac{1811 \times 22 + 4291}{1875} = 23\frac{1008}{1875}, \text{ and } \frac{1811 + 23}{60} = 30\frac{34}{60}.$$

Year last expired: 34 = Śarvarin, the end of which precedes the beginning of Śaka 1811 expired by

numerator 1000 =	194·80463
" 8 =	1·55844
$\frac{1008}{1875}$ =	196 36307 days.

Beginning of Śaka 1811 expired: 365·25868055 × 1811

601483 47047605

+ 1740621·1979

2411104·66837

deduct for $\frac{1008}{1875}$ — 196 36307

remainder 2410908·3053; which differs from the above result by 42 seconds.

I may state that handy Tables for the Jupiter-years according to the Jyôtistattva, based on the above *data*, and similar Tables for the *Sûrya-Siddhânta*, will be published in a following number of this Journal.

rule (B 2, above), exactly as much as $\frac{8589}{3750}$ is larger than $\frac{4391}{1875}$. The difference between these two fractions amounts to $\frac{7}{3750} = \frac{81}{1875} =$

numerator 3 = 0·58441 days,
" $\frac{1}{2}$ = 0·09740 "

$\frac{7}{3750}$ = 0·68181 days;

and this is the very difference between the results of the two rules;[9] for —

end of Bhâva by Jyô. t. rule 2228 230·2639;
deduct " " " " Bri. S. rule 2228 229·5821;

end of Bhâva by Jyôt. t. rule, later by 0·6818 days = 16 h. 21·8 m.

D.—The Cycle-year according to the so-called Têlinga rule.

According to this rule, the Jupiter's year coincides with the luni-solar year; and the name of the current Jupiter's year may be found thus:—To the expired year of the Kaliyuga add 13; to the expired Śaka year, 12; and from the expired Vikrama year subtract 3; divide (the sum or the remainder) by 60; the remainder gives the number of the current Jupiter's year, counting from Prabhava (inclusive).[10] Thus—

for K. Y. 4490 expired, = S. 1311 expired, = V. 1446 expired, we have:—

4490	1311	1446
+ 13	+ 12	− 3
4503	1323	1443,

divided by 60 in every case the remainder is 3 = Sukla.

Simplification of a portion of the preceding Rules.

The working of the Sûrya-Siddhânta and Jyôtistattva rules, as described above, is rendered somewhat tedious by the various multiplications which have to be gone through to find the ends of the several years. To facilitate this part of the process, I append Tables V. and VI., from which the ends of the years may be found simply by addition. In these Tables the figures for the epochs of the eras have been included in the figures for the days corresponding to the units of the years; and, as regards their use, it need only be observed that the figures for the days corresponding to the year 0 must necessarily be added up with the rest, whenever the unit of the figures for the year is 0.

To show the working of these Tables,[11] we will ask:—

(a) On what day of the Julian period, according to the *Sûrya-Siddhânta*, did the solar year Kaliyuga 4870, current, end (or the year 4871, current, begin)?

(b) When did Jupiter's year 4926 (Vilamba), without Bîja, end?

(c) According to the *Ârya-Siddhânta*, when did Śaka 1311, expired, begin?

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[9] So far as I can see, the only important difference in the results obtained by the Bṛihat-Saṁhitâ rule is that, in accordance with it, expunctions take place in the expired Śaka years 236, 997, and 1338, instead of taking place, as in the case by the Jyôtistattva rule, in the expired Śaka years 231, 998, and 1339.

[10] When I wrote the above, I had not seen the following passage in Alberuni's *India*, Sachau's Translation, Vol. II. p. 129:—"This is the method for the determination of the years of the *Shashṭiyabda*, as recorded in their books. However, I have seen Hindus who subtract 3 from the era of Vikramâditya, and divide the remainder by 60. The remainder they count off from the beginning of the great yuga. This method is not worth anything. By-the-bye: it is the same whether you reckon in the manner mentioned, or add 12 to the Śakakâla."

[11] The results obtained from Table VI. for the commencement of the Śaka year, in accordance with the *Ârya-Siddhânta*, agree exactly with the beginnings of the years, as put down in Warren's First Chronological Table, pp xxi—xxvi. As regards the results obtained from Table V., A., for the commencement of the solar year in accordance with the *Sûrya-Siddhânta*, I may state that they will be found to be uniformly later by 28 minutes 36 seconds than the results obtained from Professor Keru Lakshman's and Mr. Sh. B. Dikshit's Tables, published *ante*, Vol. XVII., pp. 269-272. Professor Keru Lakshman's results being for Bombay time and my own for Ujjain time, the real difference is 15 minutes 36 seconds, by which my results are uniformly later, and by which, accordingly, Keru Lakshman has put the Mêsha-saṅkrânti at the commencement of the Kaliyuga earlier than I have done. Taking the difference between Ujjain time and Bombay time to be 13 minutes, Keru Lakshman's Mêsha-saṅkrânti, expressed in days of the Julian period, would be 588 463·5910 days.

TABLE I.

For converting a day of the Julian period into the European date.

Old Style. Year A.D.	Day of Julian period.	Yest.	I Jan.	II Feb.	III March	IV April	V May	VI June	VII July	VIII Aug.	IX Sept.	X Oct.	XI Nov.	XII Dec.
		00	12 [12] g.K.	001	032	060	091	121	152	182	213	244	274	305	335
0	1721 057	00	000	031	060	091	121	152	182	213	244	274	305	335
100	1757 582	01	366	397	425	456	486	517	547	578	609	639	670	700
200	1794 107	02	731	762	790	821	851	882	912	943	974	004	035	065
300	1830 632	03	1 096	127	155	186	216	247	277	308	339	369	400	430
400	1867 157	04	461	492	521	552	582	613	643	674	705	735	766	796
500	1903 682	05	827	858	886	917	947	978	008	039	070	100	131	161
600	1940 207	06	2 192	223	251	282	312	343	373	404	435	465	496	526
700	1976 732	07	557	588	616	647	677	708	738	769	800	830	861	891
800	2013 257	08	922	953	982	013	043	074	104	135	166	196	227	257
900	2049 782	09	3 288	319	347	378	408	439	469	500	531	561	592	622
1000	2086 307	10	653	684	712	743	773	804	834	865	896	926	957	987
1100	2122 832	11	4 018	049	077	108	138	169	199	230	261	291	322	352
1200	2159 357	12	383	414	443	474	504	535	565	596	627	657	688	718
1300	2195 882	13	749	780	808	839	869	900	930	961	992	022	053	083
1400	2232 407	14	5 114	145	173	204	234	265	295	326	357	387	418	448
1500	2268 932	15	479	510	538	569	599	630	660	691	722	752	783	813
1600	2305 457	16	844	875	904	935	965	996	026	057	088	118	149	179
1700	2341 982	17	6 210	241	269	300	330	361	391	422	453	483	514	544
		18	575	606	634	665	695	726	756	787	818	848	879	909
		19	940	971	999	030	060	091	121	152	183	213	244	274
		20	7 305	336	365	396	426	457	487	518	549	579	610	640
		21	671	702	730	761	791	822	852	883	914	944	975	005
		22	8 036	067	095	126	156	187	217	248	279	309	340	370
		23	401	432	460	491	521	552	582	613	644	674	705	735
		24	766	797	826	857	887	918	948	979	010	040	071	101
		25	9 132	163	191	222	252	283	313	344	375	405	436	466
		26	497	528	556	587	617	648	678	709	740	770	801	831
		27	862	893	921	952	982	013	043	074	105	135	166	196
		28	10 227	258	287	318	348	379	409	440	471	501	532	562
		29	593	624	652	683	713	744	774	805	836	866	897	927
		30	958	989	017	048	078	109	139	170	201	231	262	292
		31	11 323	354	382	413	443	474	504	535	566	596	627	657
		32	688	719	748	779	809	840	870	901	932	962	993	023
		33	12 054	085	113	144	174	205	235	266	297	327	358	388
		34	419	450	478	509	539	570	600	631	662	692	723	753
1700	2341 971	35	784	815	843	874	904	935	965	996	027	057	088	118
1800	2378 495	36	13 149	180	209	240	270	301	331	362	393	423	454	484
1900	2415 019	37	515	546	574	605	635	666	696	727	758	788	819	849
		38	880	911	939	970	000	031	061	092	123	153	184	214
		39	14 245	276	304	335	365	396	426	457	488	518	549	579
		40	610	641	670	701	731	762	792	823	854	884	915	945
		41	976	007	035	066	096	127	157	188	219	249	280	310
		42	15 341	372	400	431	461	492	522	553	584	614	645	675
		43	706	737	765	796	826	857	887	918	949	979	010	040
		44	16 071	102	131	162	192	223	253	284	315	345	376	406
		45	437	468	496	527	557	588	618	649	680	710	741	771
		46	802	833	861	892	922	953	983	014	045	075	106	136
		47	17 167	198	226	257	287	318	348	379	410	440	471	501
		48	532	563	592	623	653	684	714	745	776	806	837	867
		49	898	929	957	988	018	049	079	110	141	171	202	232

New Style. Year A.D.	Day of Julian period.	Yest.	I Jan.	II Feb.	III March	IV April	V May	VI June	VII July	VIII Aug.	IX Sept.	X Oct.	XI Nov.	XII Dec.
		50	18 263	294	322	353	383	414	444	475	506	536	567	597
		51	628	659	687	718	748	779	809	840	871	901	932	962
		52	993	024	053	084	114	145	175	206	237	267	298	328
		53	19 359	390	418	449	479	510	540	571	602	632	663	693
		54	724	755	783	814	844	875	905	936	967	997	028	058
		55	20 089	120	148	179	209	240	270	301	332	362	393	423
		56	454	485	514	545	575	606	636	667	698	728	759	789
		57	820	851	879	910	940	971	001	032	063	093	124	154
		58	21 185	216	244	275	305	336	366	397	428	458	489	519
		59	550	581	609	640	670	701	731	762	793	823	854	884
		60	915	946	975	006	036	067	097	128	159	189	220	250
		61	22 281	312	340	371	401	432	462	493	524	554	585	615
		62	646	677	705	736	766	797	827	858	889	919	950	980
		63	23 011	042	070	101	131	162	192	223	254	284	315	345
		64	376	407	436	467	497	528	558	589	620	650	681	711
		65	742	773	801	832	862	893	923	954	985	015	046	076
		66	107	138	166	197	227	258	288	319	350	380	411	441
		67	472	503	531	562	592	623	653	684	715	745	776	806
		68	837	868	897	928	958	989	019	050	081	111	142	172
		69	25 203	234	262	293	323	354	384	415	446	476	507	537
		70	568	599	627	658	688	719	749	780	811	841	872	902
		71	933	964	992	023	053	084	114	145	176	206	237	267
		72	26 298	329	358	389	419	450	480	511	542	572	603	633
		73	664	695	723	754	784	815	845	876	907	937	968	998
		74	27 029	060	088	119	149	180	210	241	272	302	333	363
		75	394	425	453	484	514	545	575	606	637	667	698	728
		76	759	790	819	850	880	911	941	972	003	033	064	094
		77	28 125	156	184	215	245	276	306	337	368	398	429	459
		78	490	521	549	580	610	641	671	702	733	763	794	824
		79	855	886	914	945	975	006	036	067	098	128	159	189
		80	29 220	251	280	311	341	372	402	433	464	494	525	555
		81	586	617	645	676	706	737	767	798	829	859	890	920
		82	951	982	010	041	071	102	132	163	194	224	255	285
		83	30 316	347	375	406	436	467	497	528	559	589	620	650
		84	681	712	741	772	802	833	863	894	925	955	986	016
1700	2341 971	85	347	378	406	437	467	498	528	559	590	620	651	681
1800	2378 495	86	712	743	771	802	832	863	893	924	955	985	016	046
1900	2415 019	87	77	108	136	167	197	228	258	289	320	350	381	411
		88	442	473	501	532	562	593	623	654	685	715	746	776
		89	807	838	866	897	927	958	988	019	050	080	111	141
		90	31 172	203	231	262	292	323	353	384	415	445	476	506
		91	537	568	596	627	657	688	718	749	780	810	841	871
		92	902	933	961	992	022	053	083	114	145	175	206	236
		93	32 267	298	326	357	387	418	448	479	510	540	571	601
		94	632	663	691	722	752	783	813	844	875	905	936	966
		95	997	028	056	087	117	148	178	209	240	270	301	331
		96	33 362	393	421	452	482	513	543	574	605	635	666	696
		97	727	758	786	817	847	878	908	939	970	000	031	061
		98	34 092	123	151	182	212	243	273	304	335	365	396	426
		99	457	488	516	547	577	608	638	669	700	730	761	791
		100	822	853	881	912	942	973	003	034	065	095	126	156
		101	35 187	218	246	277	307	338	368	399	430	460	491	521
		102	552	583	611	642	672	703	733	764	795	825	856	886
		103	917	948	976	007	037	068	098	129	160	190	221	251
		104	36 282	313	341	372	402	433	463	494	525	555	586	616
		105	647	678	706	737	767	798	828	859	890	920	951	981
		106	37 012	043	071	102	132	163	193	224	255	285	316	346
		107	377	408	436	467	497	528	558	589	620	650	681	711
		108	742	773	801	832	862	893	923	954	985	015	046	076
		109	38 107	138	166	197	227	258	288	319	350	380	411	441
		110	472	503	531	562	592	623	653	684	715	745	776	806
		111	837	868	897	928	958	989	019	050	081	111	142	172
		112	39 203	234	262	293	323	354	384	415	446	476	507	537
		113	568	599	627	658	688	719	749	780	811	841	872	902
		114	933	964	992	023	053	084	114	145	176	206	237	267
		115	40 298	329	358	389	419	450	480	511	542	572	603	633
		116	664	695	723	754	784	815	845	876	907	937	968	998
		117	41 029	060	088	119	149	180	210	241	272	302	333	363
		118	394	425	453	484	514	545	575	606	637	667	698	728
		119	759	790	819	850	880	911	941	972	003	033	064	094
		120	42 125	156	184	215	245	276	306	337	368	398	429	459
		121	490	521	549	580	610	641	671	702	733	763	794	824
		122	855	886	914	945	975	006	036	067	098	128	159	189
		123	43 220	251	280	311	341	372	402	433	464	494	525	555
		124	586	617	645	676	706	737	767	798	829	859	890	920
		125	951	982	010	041	071	102	132	163	194	224	255	285
		126	44 316	347	375	406	436	467	497	528	559	589	620	650
		127	681	712	741	772	802	833	863	894	925	955	986	016
		128	45 047	078	106	137	167	198	228	259	290	320	351	381
		129	412	443	471	502	532	563	593	624	655	685	716	746
		130	777	808	836	867	897	928	958	989	020	050	081	111
		131	46 142	173	202	233	263	294	324	355	386	416	447	477
		132	508	539	567	598	628	659	689	720	751	781	812	842
		133	873	904	932	963	993	024	054	085	116	146	177	207
		134	238	269	297	328	358	389	419	450	481	511	542	572
		135	603	634	663	694	724	755	785	816	847	877	908	938
		136	969	000	028	059	089	120	150	181	212	242	273	303
		137	334	365	393	424	454	485	515	546	577	607	638	668
		138	699	730	758	789	819	850	880	911	942	972	003	033
		139	064	095	124	155	185	216	246	277	308	338	369	399
		140	430	461	489	520	550	581	611	642	673	703	734	764
		141	795	826	854	885	915	946	976	007	038	068	099	129
		142	160	191	219	250	280	311	341	372	403	433	464	494

[12] When calculating for one of the secular years 1700, 1800, 1900, new style, use the line 00 [g. K.], not 00.

(*a*) End of Kaliyuga 4870 current, by Table V, A.	(*b*) End of Jupiter's year 4926, without Bîja, by Table V, B.	(*c*) Commencement of Śaka 1311, expired, by Table VI.
4000 = 1461 035·02600	4000 = 1444 106·88412	1000 = 365 258·68055
800 = 292 207·00520	900 = 324 924·04893	300 = 109 577·60416
70 = 25 568·11295	20 = 7 220·53442	10 = 3 652·58681
0 = 588 463·60240	6 = 590 631·91033	1 = 1749 986·45658
4870 = 2367 273·74655;	4926 = 2366 883·37780;	1311 = 2228 475·32810;

just as has been found above, pp. 193, 194, and 198, by multiplication and by the addition of the epochs.

The Saṁkrântis and Solar Months.

For those who would wish to use the Tables V. A. and VI. to ascertain the exact end of a solar month or the occasion of a Saṁkrânti, I have added Table VII. which gives the collective numbers of days of the solar months. To give an example for the use of this Table, we will ask: —When did the Uttarâyaṇa-saṁkrânti, according to the *Sûrya-Siddhânta*, take place in Vikrama 1234 = Kaliyuga 4278 expired (above, p. 138)?

By Table V. A,	4000 =	1461 035·02600
	200 =	73 051·75130
	70 =	25 568·11295
	8 =	591 385·67245
By Table VII., Uttarâyaṇa-saṁkrânti	=	275·65844
sum		2151 316·22114;

which by Tables I. and II. corresponds to 25th December, A.D. 1177, 5 h. 18·4 m. Accordingly, in Vikrama 1234 expired, the Uttarâyaṇa-saṁkrânti took place, at Ujjain, 5 h. 18·4 m. after mean sunrise of 25th December, A.D. 1177.

An Example for all Rules.

To show the working of the above rules, I select a date which is given in Professor Weber's *Catalogue of the Berlin Sanskrit MSS.*, Vol. II. p. 55, and which runs thus:—

Saṁvat 1531 Śâkê 1396 pravarttamânê **Subhakṛita(n)**-nâmni saṁvatsarê.....Kârttika-śudi 9 Budha-vâsarê Dhanishṭhâ-nakshatrê Vṛiddhi-yôgê Kaulava-karaṇê . . . . *i.e.* 'while the (Vikrama) year 1531 (and) the Śaka year 1396 is proceeding, in (Jupiter's) year **Subhakṛit**, on the 9th of the bright half of Kârttika, on Wednesday, the *nakshatra* being Dhanishṭhâ, the *yôga* Vṛiddhi, and the *karaṇa* Kaulava' . . . .

The corresponding European date (for the Vikrama year 1531 and the Śaka year 1396, both expired, notwithstanding the expression *pravartamânê* in the date), undoubtedly is **Wednesday, 19th October, A.D. 1474**, when the 9th *tithi* of the bright half and the *karaṇa* Kaulava ended 13 h. 15 m. after mean sunrise, and when the moon was in Dhanishṭhâ up to 12 h. 29 m., and the *yôga* was Vṛiddhi up to 13 h. 26 m. after mean sunrise. And what concerns us now, is to find the beginning or end, or both, of the year **Subhakṛit** which is mentioned in the date, in accordance with the different rules.

(a). The year Subhakṛit according to the Sûrya-Siddhânta.

To find the commencement of Subhakṛit, is equivalent to finding the end of the preceding year Plava, which is the 9th year of the cycle counted from Vijaya (inclusive). We now have:—

Vikrama 1531 + 3044 = Kaliyuga 4575; divided by 85 = 53 $\frac{70}{85}$ = 54; 4575 + 54 = 4629; divided by 60 leaves remainder 9.

Accordingly Plava (the 9th year of the cycle, from Vijaya) was the 4629th year of Jupiter

TABLE II.

For converting the decimals of the day into hours and minutes.

d 0.	h	m	d 0.	h	m	d 0·00	m	d 0·00	m
00	0	0·0	50	12	0·0	00	0·0	50	7·2
01	0	1·4	51	12	1·4	01	0·1	51	7·3
02	0	2·8	52	12	2·8	02	0·3	52	7·5
03	0	4·2	53	12	4·2	03	0·4	53	7·6
04	0	5·6	54	12	5·6	04	0·6	54	7·8
05	1	12·0	55	13	12·0	05	0·7	55	7·9
06	1	26·4	56	13	26·4	06	0·9	56	8·1
07	1	40·8	57	13	40·8	07	1·0	57	8·2
08	1	55·2	58	13	55·2	08	1·2	58	8·4
09	2	9·6	59	14	9·6	09	1·3	59	8·5
10	2	24·0	60	14	24·0	10	1·4	60	8·6
11	2	38·4	61	14	38·4	11	1·6	61	8·8
12	2	52·8	62	14	52·8	12	1·7	62	8·9
13	3	7·2	63	15	7·2	13	1·9	63	9·1
14	3	21·6	64	15	21·6	14	2·0	64	9·2
15	3	36·0	65	15	36·0	15	2·2	65	9·4
16	3	50·4	66	15	50·4	16	2·3	66	9·5
17	4	4·8	67	16	4·8	17	2·4	67	9·6
18	4	19·2	68	16	19·2	18	2·6	68	9·8
19	4	33·6	69	16	33·6	19	2·7	69	9·9
20	4	48·0	70	16	48·0	20	2·9	70	10·1
21	5	2·4	71	17	2·4	21	3·0	71	10·2
22	5	16·8	72	17	16·8	22	3·2	72	10·4
23	5	31·2	73	17	31·2	23	3·3	73	10·5
24	5	45·6	74	17	45·6	24	3·5	74	10·7
25	6	0·0	75	18	0·0	25	3·6	75	10·8
26	6	14·4	76	18	14·4	26	3·7	76	10·9
27	6	28·8	77	18	28·8	27	3·9	77	11·1
28	6	43·2	78	18	43·2	28	4·0	78	11·2
29	6	57·6	79	18	57·6	29	4·2	79	11·4
30	7	12·0	80	19	12·0	30	4·3	80	11·5
31	7	26·4	81	19	26·4	31	4·5	81	11·7
32	7	40·8	82	19	40·8	32	4·6	82	11·8
33	7	55·2	83	19	55·2	33	4·8	83	12·0
34	8	9·6	84	20	9·6	34	4·9	84	12·1
35	8	24·0	85	20	24·0	35	5·0	85	12·2
36	8	38·4	86	20	38·4	36	5·2	86	12·4
37	8	52·8	87	20	52·8	37	5·3	87	12·5
38	9	7·2	88	21	7·2	38	5·5	88	12·7
39	9	21·6	89	21	21·6	39	5·6	89	12·8
40	9	36·0	90	21	36·0	40	5·8	90	13·0
41	9	50·4	91	21	50·4	41	5·9	91	13·1
42	10	4·8	92	22	4·8	42	6·0	92	13·2
43	10	19·2	93	22	19·2	43	6·2	93	13·4
44	10	33·6	94	22	33·6	44	6·3	94	13·5
45	10	48·0	95	22	48·0	45	6·5	95	13·7
46	11	2·4	96	23	2·4	46	6·6	96	13·8
47	11	16·8	97	23	16·8	47	6·8	97	14·0
48	11	31·2	98	23	31·2	48	6·9	98	14·1
49	11	45·6	99	23	45·6	49	7·1	99	14·3

TABLE III.

The Sixty-Year Cycle of Jupiter.

(The figures to the right refer to the Sûrya-Siddhânta rule only.)

No.	Name.	No.	No.	Name.	No.
1	Prabhava	35	31	Hêmalamba ...	5
2	Vibhava	36	32	Vilamba	6
3	Śukla.....	37	33	Vikârin	7
4	Pramôda	38	34	Sarvarin	8
5	Prajâpati	39	35	Plava.....	9
6	Aṅgiras.....	40	36	Śubhakṛit.....	10
7	Śrîmukha	41	37	Śôbhana	11
8	Bhâva	42	38	Krôdhin	12
9	Yuvan	43	39	Viśvâvasu.....	13
10	Dhâtṛi	44	40	Parâbhava ..	14
11	Îśvara	45	41	Plavanga	15
12	Bahudhânya...	46	42	Kîlaka	16
13	Pramâthin ...	47	43	Saumya.....	17
14	Vikrama	48	44	Sâdhârana ...	18
15	Bhṛiśya	49	45	Virôdhakṛit ...	19
16	Chitrabhânu...	50	46	Paridhâvin ...	20
17	Subhânu	51	47	Pramâdin	21
18	Târana	52	48	Ânanda.....	22
19	Pârthiva	53	49	Râkshasa	23
20	Vyaya	54	50	Anala	24
21	Sarvajit.....	55	51	Piṅgala	25
22	Sarvadhârin...	56	52	Kâlayukta ...	26
23	Virôdhin	57	53	Siddhârthin ...	27
24	Vikṛita	58	54	Raudra.....	28
25	Khara	59	55	Durmati	29
26	Nandana	60	56	Dundubhi.....	30
27	Vijaya	1	57	Rudhirôdgârin	31
28	Jaya	2	58	Raktâksha ...	32
29	Manmatha ...	3	59	Krôdhana.....	33
30	Durmukha ...	4	60	Kshaya.....	34

TABLE IV.

For converting the fraction of the first term of the Jyôtistattva and Bṛihat-Saṁhitâ rules into days.

Numerator.	Days.	Numerator.	Days.	Numerator.	Days.
1000	194·80463	100	19·48046	10	1·94805
900	175·32417	90	17·53242	9	1·75324
800	155·84370	80	15·58437	8	1·55844
700	136·36324	70	13·63632	7	1·36363
600	116·88278	60	11·68828	6	1·16883
500	97·40231	50	9·74023	5	0·97402
400	77·92185	40	7·79218	4	0·77922
300	58·44139	30	5·84414	3	0·58441
200	38·96093	20	3·89609	2	0·38961
100	19·48046	10	1·94805	1	0·19480
				½	0·09740

since the commencement of the Kaliyuga; and to find the end of Plava (or commencement of Subhakṛit), without Bija, we proceed by Table V, B.:—

4000	=	1444 106·88412
600	=	216 616·03262
20	=	7 220·53442
9	=	591 714·99049
4629	=	2259 658·4416,

i.e. 10th August, A.D. 1474, 10 h. 35·9 m., — end of Plava, or commencement of Subhakṛit, without Bija; and, to find the end of Subhakṛit without Bija, by adding one year without Bija,—

	2259 658·4416
+	361·0267
	2260 019·4683,

i.e. 6th August, A.D. 1475, 11 h. 14·4 m., — end of Subhakṛit, without Bija.

Similarly, for the end of Plava (or commencement of Subhakṛit) with Bija, we have by Table V, C.:—

4000	=	1444 138·60424
600	=	216 620·79064
20	=	7 220·69302
9	=	591 715·06186
4629	=	2259 695·1498,

i.e. 16th September, A.D. 1474, 3 h. 35·7 m., — end of Plava, or commencement of Subhakṛit, with Bija; and, for the end of Subhakṛit with Bija, by adding one year with Bija,—

	2259 695·1498
+	361·0347
	2260 056·1845,

i.e. 12th September, A.D. 1475, 4 h. 25·7 m., — end of Subhakṛit, with Bija.

Anyone who will take the trouble to calculate, *e.g.*, the commencement of Subhakṛit with Bija, by Warren's Tables, will find that, according to them, Subhakṛit began 194 days 16 h. 4 m. 38 s. before the commencement of Kaliyuga 4576 expired; while according to my result it began only 192 days, 12 h. 32 m. 6 s. before the same moment, *i.e.* 2 days, 3 h. 32 m. 32 s. later (Kaliyuga 4576 expired having begun, according to the *Sûrya-Siddhânta*, 27th March, A.D. 1475, 16 h. 7·8 m.,—though for us this is of no moment whatever). And in the present case, one disadvantage of the rules given in the *Kâla-Saṁkalita* is that, starting as we must from Vikrama 1531 = Kaliyuga 4575 expired, we do not find the beginning of Subhakṛit at all, and that, after we have written out one set of figures and have discovered the uselessness of proceeding any further, we must start a new calculation and write out another set of figures, with the basis of Kaliyuga 4576 expired.

(b). The year Subhakṛit according to the Jyôtustattva.

Here it must be borne in mind that Subhakṛit is the 36th and Plava the 35th year of the cycle, counted from Prabhava inclusive.

Starting now from Śaka 1396 expired, the year mentioned in the date, we have —

$$\frac{1396 \times 22 + 4291}{1875} = 18\,\frac{1253}{1875} \text{ and } \frac{1396 + 18}{60} = 23\,\frac{34}{60}$$

Here the numerator of the second fraction $\left(\frac{34}{60}\right)$ at once shows that, at the commencement of Śaka 1396 expired, the last expired year of the cycle was only 34 = Sarvarin; but (to avoid a fresh start with the basis of Śaka 1397 expired) we shall nevertheless go on with our calculation, to find the end of Sarvarin; to which we shall then add one ordinary Jupiter's year to find the end of Plava (or commencement of Subhakṛit); having found which, we shall add another year

TABLE V.

For finding the end of any solar year of the Kaliyuga, and of the Cycle-year without or with Bija, according to the Sûrya-Siddhânta.

Years.	A.—Days for solar years.	B.—Days for cycle-years without Bîja.	C.—Days for cycle-years with Bîja.
5000	1826 293·78250	1805 133·60515	1805 173·25530
4000	1461 035·02600	1444 106·88412	1444 138·60424
3000	1095 776·26950	1083 080·16309	1083 103·95318
2000	730 517·51300	722 053·44206	722 069·30212
1000	365 258·75650	361 026·72103	361 034·65106
900	328 732·88085	324 924·04893	324 931·18595
800	292 207·00520	288 821·37682	288 827·72085
700	255 681·12955	252 718·70472	252 724·25574
600	219 155·25390	216 616·03262	216 620·79064
500	182 629·37825	180 513·36051	180 517·32553
400	146 103·50260	144 410·68841	144 413·86042
300	109 577·62695	108 308·01631	108 310·39532
200	73 051·75130	72 205·34421	72 206·93021
100	36 525·87565	36 102·67210	36 103·46511
90	32 873·28808	32 492·40489	32 493·11860
80	29 220·70052	28 882·13768	28 882·77208
70	25 568·11295	25 271·87047	25 272·42557
60	21 915·52539	21 661·60326	21 662·07906
50	18 262·93782	18 051·33605	18 051·73255
40	14 610·35026	14 441·06884	14 441·38604
30	10 957·76269	10 830·80163	10 831·03953
20	7 305·17513	7 220·53442	7 220·69302
10	3 652·58756	3 610·26721	3 610·34651
9	591 750·93121	591 714·99049	591 715·06186
8	591 385·67245	591 353·96377	591 354·02721
7	591 020·41370	590 992·93705	590 992·99256
6	590 655·15494	590 631·91033	590 631·95791
5	590 289·89618	590 270·88361	590 270·92326
4	589 924·63743	589 909·85688	589 909·88860
3	589 559·37867	589 548·83016	589 548·85395
2	589 194·11991	589 187·80344	589 187·81930
1	588 828·86116	588 826·77672	588 826·78465
0	588 463·60240	588 465·75000	588 465·75000

TABLE VI.

For finding the end of any solar year of the Śaka era according to the Ârya-Siddhânta.

Years.	Days for solar years of the Śaka era.
1000	365 258·68055
900	328 732·81249
800	292 206·94444
700	255 681·07638
600	219 155·20833
500	182 629·34027
400	146 103·47222
300	109 577·60416
200	73 051·73611
100	36 525·86805
90	32 873·28125
80	29 220·69444
70	25 568·10764
60	21 915·52083
50	18 262·93403
40	14 610·34722
30	10 957·76042
20	7 305·17361
10	3 652·58681
9	1752 908·52602
8	1752 543·26734
7	1752 178·00866
6	1751 812·74998
5	1751 447·49130
4	1751 082·23262
3	1750 716·97394
2	1750 351·71526
1	1749 986·45658
0	1749 621·19790

TABLE VII.

For collective days of Solar Months.

	End of month	Saṁkrânti.	By Sûrya-Siddhânta.	By Ârya-Siddhânta.
1	Vaiśâkha.	Vṛisha.	30·92557	30·92556
2	Jyaishṭha.	Mithuna.	62·32891	62·32890
3	Âshâḍha.	Karkaṭa; Dakshiṇâyana.	93·93948	93·93946
4	Śrâvaṇa.	Siṁha.	125·40919	125·40947
5	Bhâdrapada.	Kanyâ.	156·44562	156·44568
6	Âśvina.	Tulâ.	186·90174	186·90170
7	Kârttika.	Vṛiśchika.	216·80370	216·80365
8	Mârgaśirsa.	Dhanuḥ.	246·31038	246·31032
9	Paushа.	Makara; Uttarâyaṇa.	275·65844	275·65838
10	Mâgha.	Kumbha.	305·11290	305·11283
11	Phâlguna.	Mîna.	334·91958	334·91950
12	Chaitra.	Mêsha.	365·25876	365·25868

to find the end of Śubhakṛit (the next expunction being due only in Śaka 1424 expired). We have then—

numerator	1000 =	194·80463	days
"	200 =	38·96093	"
"	50 =	9·74023	"
"	3 =	0·58441	"
	$\frac{1253}{1875}$ =	244·09020	days;

and for the commencement of Śaka 1396 expired, by Table VII.—

1000 =	365 258·68055	
300 =	109 577·60416	
90 =	32 873·28125	
6 =	1751 812·74998	
1396 =	2259 522·3159	commencement of Śaka 1396 expired;
	— 244·0902	
	2259 278·2257	end of Śarvarin (No. 34);
	+ 360·9730	
	2259 639·1987	end of Plava (No. 35) or commencement of Śubhakṛit;
	+ 360·9730	
	2260 000·1717	end of Śubhakṛit (No. 36).

Converting now the days of the Julian period for the beginning and end of Śubhakṛit, we find:—

commencement of Śubhakṛit: 22nd July, A.D. 1474, 4 h. 46·1 m.;
end of Śubhakṛit: 18th July, A.D. 1475, 4 h. 7·2 m.

(c). The year Śubhakṛit by the Bṛihat-Saṁhitâ rule.

Having already found the commencement and end of Śubhakṛit by the Jyôtistattva rule, we find the same, in accordance with the Bṛihat-Saṁhitâ rule, by deducting from the sums of days found, in either case, 0·6818[1].

Commencement of Śubhakṛit by Jyôtistattva rule: 2259 639·1987
— 0·6818
2259 638·5169,

i.e. 21st July, A.D. 1474, 12 h. 24·3 m., — commencement of Śubhakṛit by Bṛihat-Saṁhitâ rule.

End of Śubhakṛit by Jyôtistattva rule: 2260 000·1717
— 0·6818
2259 999·4899,

i.e. 17th July, A.D. 1475, 11 h. 45·5 m., — end of Śubhakṛit by Bṛihat-Saṁhitâ rule.

(d). By the Têlinga rule

the Jupiter's year for Vikrama 1531 and Śaka 1396, both expired, would be the 28th year of the cycle, counted from Prabhava, *i.e.* Jaya, and the year Śubhakṛit would not be due till Vikrama 1539 or Śaka 1404, expired.

The result then is that the year Śubhakṛit, which is mentioned in the date, lasted,—

by the Sûrya-Siddhânta rule,—
without Bîja, from 10th August, A.D. 1474, 10 h. 35·9 m., to 6th August, A.D. 1475, 11 h. 14·4 m.;
with Bîja, from 16th September, A.D. 1474, 3 h. 35·7 m., to 12th September, A.D. 1475, 4 h. 25·7 m.;

by the Jyôtistattva rule,—
from 22nd July, A.D. 1474, 4 h. 46·1 m., to 18th July, A.D. 1475, 4 h. 7·2 m.;

by the Bṛihat-Saṁhitâ rule,—
from 21st July A.D. 1474, 12 h. 24·3 m., to 17th July, A.D. 1475, 11 h. 45·5 m.

And accordingly, by every one of the three rules, the date, **Wednesday, the 19th October, A.D. 1474,** did fall in the year **Subhakrit,** and the writer of the date was strictly correct in quoting that year. — The result shows how necessary it may be to calculate exactly the commencement of a Jupiter's year; for, in accordance with the ordinary (and on the whole very useful) Tables, the writer certainly ought to have quoted the year *Plava*, because that year was current at the commencement of the solar year in which the date was written.

Illustration of the use of Table I.

(*a*) What was the European date (old style) for the day 2259 999 ?

Given the day...	2259 999		
Deduct next lower figure in column of centuries ..	— 2232 407	=	A.D. 1400 (old style)
Remainder	27 592		
Deduct next lower figure in table of years.....	— 27 575	=	75, July ;
Remainder	17,		A.D. 1475, July.

Answer :—17th July, A.D. 1475, old style.

(*b*) What was the European date (new style) for the day 2410 637 ?

Given the day ..	2410 637		
Deduct next lower figure in column of centuries (new style)	— 2378 495	=	A.D. 1800 (new style);
Remainder	32 142		
Deduct next lower figure in table of years.....	— 32 111	=	87, December ;
Remainder	31,		A.D. 1887, December.

Answer :—31st December, A.D. 1887, new style.

INSCRIPTIONS OF THE KINGS OF CHEDI.

BY PROFESSOR F. KIELHORN, C.I.E., GÖTTINGEN.

I edit the first four of these inscriptions from rubbings supplied to me by Mr. Fleet, to whom they were made over by Sir A. Cunningham. And my account of the fifth inscription is also from a rubbing received in the same way; but in this instance, owing partly to the condition of the original inscription and partly to the deficiencies of the rubbing, I can do little more than point out the names of royal personages, which happen to be legible in the record, as it presents itself to me in the rubbing.

A. — Têwar Stone-Inscription of Gayâkarṇadêva.

The (Chêdi) year 902.

This inscription, according to Sir A. Cunningham,[1] is on a light-green stone, which appears to have been found at **Têwar,** the ancient **Tripurî,** once the capital city of the main branch of the **Kalachuri rulers of Chêdi,** and now a village about six miles to the west of Jabalpur, in the Central Provinces. No information is available as to where the stone is at present.

The inscription contains 22 lines. The **writing** covers a space of 12¾″ broad by 14¼″ high, and with the exception of perhaps one *akshara*, which is indistinct in the rubbing, it is in a state of perfect preservation. The **size of the letters** is between $\frac{3}{8}$″ and $\frac{7}{16}$″. The **characters** are **Nâgarî.** The **language** is Sanskrit; and, with the exception of the introductory *ôṁ namaḥ Śivâya*, the inscription is in verse throughout. As regards **orthography,** *b* is denoted by the sign for *v*, everywhere except in *bhavêt*, line 16, *abdhiḥ*, line 19, and *abda* (?), line 21; and the dental is twice put for the palatal sibilant.

[1] *Archæol. Survey of India*, Vol. IX. p. 99, No. vi.

The inscription was composed by Pṛithvidhara, the son of Dharaṇidhara, and engraved by Mahidhara[2] (lines 17-20); and its proper object is to record (in lines 5-17) the erection of a temple of Śiva by a Pâśupata (or *pâñchârthika*[3]) ascetic, named Bhâvalralman, a disciple of the ascetic Bhâvatêjas of the Ananta *gôtra*. There is nothing of special interest in this part of the inscription, excepting the name Gâhuṇḍa in line 15, which appears to be a local designation of Śiva.

By way of introduction it is stated (in lines 3-4) that in the gôtra of Atri there was the king Karṇadêva, whose son was the king Yaśaḥkarṇa, from whom again sprang the ruling king Gayakarṇadêva; and (in lines 4-5) the wish is expressed that this Gayâkarṇa, together with his son, the *Yuvarâja* or heir apparent, Narasiṁha, may rule the earth for ever. And Gayakarṇadêva is mentioned again in the date, in the concluding lines 20 22, according to which this eulogy was put up "on Arkavâra or Sunday, on the first lunar day in the bright half of the month Śuchi (or Ashâḍha), while the illustrious Gayâkarṇadêva was protecting the country, when the Chêdi time had gone on increasing to nine hundred and a couple of years;" *i. e.*, in the Chêdi year 902, on Sunday, the first of the bright half of Ashâḍha.

In the original, the first portion of the date (*nava-śata-yugal-âhâ-âdhikya-gê Chêdi-diśhṭê*) is oddly expressed; but as, with the exception of the first *akshara* in line 21, which might possibly be *śâ*, every letter of the original is perfectly clear, and since *nava-śata* is 900 and *yugala* 'a pair' or 'couple' or 'two,' I do not see how *nava-śata-yugala* could mean anything but 902. Nor have I any doubt about the meaning of *Chêdi-diśhṭê*; for according to the lexicographers *diśhṭa* is one of the synonyms of *kâla*,[4] and *Chêdi-diśhṭa* therefore is equivalent to *Chêdi-kâla*, with which may be compared the well-known *Mâlava-kâla*, used to indicate another era. I need hardly point out that, even if it had not been dated, the present inscription, in which Narasiṁha is described as *Yuvarâja*, would necessarily have had to be placed before the Chêdi year 907, the date of Allaṇadêvî's inscription in which the same Narasiṁhadêva is spoken of as ruling prince.

As regards the European equivalent of the date, I have shown *ante*, Vol. XVII. p. 216, No. 5, that, with my epoch of the Chêdi era, it is Sunday, 17th June, A. D. 1151; and having convinced myself that Sir A. Cunningham's latest statements regarding the original date are substantially correct, I now attach to the date its due value for helping to fix the epoch of the Chêdi era.

TEXT.[5]

1 Ôṁ namaḥ Śivâya ॥ Trailôkya[6]-saudha-śilpî yas=trivêdî-vâkya-satkaviḥ । nitya-prayatna-vô(hô)dh-âchchhaḥ sô=shṭamûrttiḥ śriyê-stu vaḥ ॥

2 Kaladhauta[7]-śuktir=iva chandra-kalâ jayati Śmarântaka-śirô-vidhṛitâ । alik-âkshi-vahni-janit-ôgra-tṛishâ sutayâ gi-

3 rêḥ surasarit-payasê ॥ Âtrêya[8]-gôtrê ‘śkhila-râja-chakra-jiṅgîshu-râjô=jani Karṇa-dêvaḥ । tasmâd=Yaśaḥkarṇa-narêśva(śva)-

4 rô=bhût=tasy=âtmajô=yaṁ Gayakarṇadêvaḥ ॥ Â-kalpaṁ[9] pṛithivîṁ śâstu śrîḥ Gayâkarṇa-pârthivaḥ । saṁgatô Narasiṁhôna yu-

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[2] The same persons are mentioned in lines 26-29 of the inscription of Allaṇadêvî of the Chêdi year 907; *Journal Americ. Or. Soc.* Vol. VI. p. 528, and *Archæol. Survey of Western India*, No. 10, p. 100. And, as was first pointed out by Dr. Hall, in *Jour. Am. Or. Soc.* Vol. VI. p. 533, Nâmadêva, the son of Mahîdhara, engraved an inscription (unpublished) of the year 920, which is now in the Nâgpur Museum.

[3] The dictionaries have no quotation for this word from the actual literature. Its meaning is evident from the *Saraṁdarśana-saṁgrahu*; see translation by Cowell and Gough, p. 108.

[4] Compare, *e. g.*, *Amarakôśa*, Bo Ed., p. 22, l. 8, *kâlô diśhṭô-pya-nuśhâpi*.—The word *diśhṭa* does not appear to have been met with before, in this sense, in actual literature. Our writer, in my opinion, preferred it to the ordinary word *kâla*, because it begins with the same syllable with which the word *Chêdi* ends.

[5] From the rubbing.

[6] Metre, Ślôka (Anushṭubh).

[7] Metre, Pramitâkshara; the second half of this verse does not admit of a proper construction.

[8] Metre, Upajâti.

[9] Metre, Ślôka (Anushṭubh).

5 varâjêna sûnunâ || Gôtrô[10] 5 naṁta-samâhâvayô=bhavad=ina-prakhyas=tapas-tôjasâ dṛishṭâ-
dṛishṭa-viśuddha-karmma-nirataḥ śrî-Bhâva-
6 tôjâ gurur || (1) âchâryô=dbhuta-kêval-ârtha-vachasâṁ pâñchârtthikô yaḥ sudhîḥ
kâma-krôdha-ja-varggga-durygga-vipina-plôsha-
7 aya dâv-ânalaḥ || Srutvâ[11] samast-âgama-yôga-śâstraṁ vyâkhyâya cha nyâya-
Kaṇâda-śâstraṁ | abhyasya yaḥ Pâśupataṁ cha yôgaṁ
8 Śivasya sâyôjyam=avâpa vô(bô)dhât || Prathamas[12]=tasya śishyô=yaṁ Bhâva-
vra(bra)hma-tapôdhanaḥ | taṁaḥ-karmma-ratô nityaṁ karmma-sâ[ṁ]-
9 nyâsikô=pi yaḥ || Kaupînamâtra[13]-vasanaḥ śuchi-bhasma-śâyî paṁchârtthu-vô(bô)dha-
sukṛitî mita-bhaikshu-bhôjî | yô vra(bra)hmacharya-
10 vidhin=ânya-Sanatkumârûḥ Pâtañjal-âgama-nirûpita-yôga-saṁgaḥ || Bhiksh[14]-ôpârjjita-
kâñchan-ânna-vasanaiḥ saṁpriṇayaty=a-
11 rtthinaḥ snêhêna praguṇîkarôti sudhiyaḥ saṁtarpitâṁ=sûṇritaiḥ | klêś-ôṇmûlana-
dharmmya-karmma-nirataḥ śâkshâtkṛita-
12 Tryaṁva(ba)kô Bhâvavra(bra)hma-samas=tapasvishu kalau dṛishṭô na pâñchârtthikaḥ ||
Parigruha[15]-vimuktô=pi [gṛihṇâ]ti hṛidi ya[ḥ]* Śivaṁ |
13 kâma-krôdhau nigṛihṇâti kshamâvân=api sad-vrataiḥ || Prâṇâyâma[16]-samâdhi-siddha-
niyama-dhyân-âsanair=anv-ahaṁ yaḥ kṛitvâ
14 hṛiday-âmvu(bu)jô Smara-ripuṁ vu(bu)ddhyâ samabhyasyati | maitrî tasya sudhî-
bhir=âtma-muditâ śâstr-âgamê yôginaḥ śishyâṇâṁ karuṇâ
15 bhavêch=cha vishny-ôpâkshâ Śiva-jñânataḥ || Rathayâtrôtsav[17]-ârchchâbhir=Gôâhuṁda-
jagatîm=imâṁ | sô=ṁmchakâra prâkâra-dêvâgâra-maṭhair=a-
16 pi || Pârtt·na[18] dharmmêṇa nivarttakêna muktir=bhavêt=saṁyaminâṁ=cha
vô(bô)dhât | ûtad=[d*]vayaṁ prâptum=avaṁ mumukshur=vvyadhâpayad=dêvam=
imaṁ Śivasya ||
17 Bhiksh[19]-dhanêna têṇ=ôtaṁ maṁdiraṁ Kâma-vidvishaḥ | kâritaṁ muktayê bhaktyâ
kîrttayê cha kṛitâtmanâṁ || Śruti[20]-smṛit-îhâsa[21]-purâṇa-vêttâ
18 vipraḥ sudhîḥ śrî-Dharaṇîdharô=bhût | vyadhâd=imâṁ tat-tanayaḥ praśastiṁ
Pṛitthvîdharas[22]-tarkka-viśuddha-vu(bu)ddhiḥ || Yâvan[23]=Mêruḥ sva-
19 raṇa-kumbhaḥ pṛithivyâṁ yâvad=Gaṁgâ varttatê yâvad=abdhiḥ | yâval=lôkê
chaṁdra-sûryau chakâstaḥ Saṁbhôr=ôtat-kîrttanaṁ tâvad=astâṁ ||
20 Viśvakarmma[24]-kṛitaṁ śâstraṁ vêtti yô=rthêna karmmaṇâ | utkîrṇavân=imâṁ
śastâṁ praśastiṁ sa Mahîdharaḥ || Nava[25]-sa(ba)ta-yugal-â-
21 [bd ?]-âdhikya-gô Chêdi-dishṭ[ô] ja[na*]padam=avat=imaṁ śrî-Gayâkarṇṇadêvô |
pratipadi Suchi-mâsa-śvêta-pakshê=rkka-vâ-
22 rê Śiva-śarvṇa-samîpê sthâpit=ôyaṁ praśastiḥ || [26] ||

B.—Lâl-Pahâḍ Rock-Inscription of Narasiṁhadêva.

The (Chêdi) year 909.

This inscription[1] is rudely engraved on a piece of rock, on the top of a hill called **Lâl-Pahâḍ**, near Bharhut (properly Bharaut) in the Central Provinces; Indian Atlas, Sheet No. 89, Lat. 24° 27′ N., Long. 80° 55′ E. It was discovered in 1873-74 by Sir A. Cunningham, by whom a transcript of it, accompanied by a photozincograph, was published in *Archæol. Survey of India*, Vol. IX. p. 94, and Plate ii.

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[10] Metre, Śârdûlavikrîḍita.
[11] Metre, Upajâti.
[12] Metre, Ślôka (Anushṭubh).
[13] Metre, Vasantatilakâ.
[14] Metre, Śârdûlavikrîḍita.
[15] Metre, Ślôka (Anushṭubh).
[16] Metre, Śârdûlavikrîḍita.
[17] Metre, Ślôka (Anushṭubh).
[18] Metre, Upajâti.
[19] Metre, Ślôka (Anushṭubh).
[20] Metre, Upajâti.
[21] The writer clearly meant to say *-smṛit-îtihâsa*.
[22] For the doubling of the consonant *th* of *pṛithvî*° see Pâṇini viii., 4, 47.
[23] Metre, Śâlinî.
[24] Metre, Ślôka (Anushṭubh).
[25] Metre, Mâlinî.
[26] Between these signs of punctuation there is an ornamental full stop.

[1] *Archæol. Survey of India*, Vol. IX. p. 1.

The inscription contains eight lines, of which the last appears to be separated from the rest by an empty space. The writing of the first seven lines covers a space of about 17½" high by 2' 6" broad in the first three, and 1' 9½" broad in the following lines; while the separate eighth line is 16" long. Throughout, the writing appears to be well preserved, though in the rubbing one or two *aksharas* are not as distinct as one could wish them to be. The size of the letters is between 1½" and 2". The characters are Nâgarî; and the language is Sanskrit. As regards orthography, *b* is denoted by the sign for *v*, and the dental sibilant is employed for the palatal everywhere except in the word *śrî*.

After the introductory "Ôṁ, may it be well! (*may*) fortune (*attend*)!" the inscription (in lines 1-5) has (corresponding to the ordinary "in the reign of victory of," etc.) the words: "the feet of the *Paramabhaṭṭâraka, Mahârâjâdhirâja*, and *Paramêśvara*, the devout worshipper of Mahêśvara (Śiva), the illustrious **Narasiṁhadêva**, the lord over **Trikaliṅga**, who by his own arm has acquired the (*title of*) lord over the three *Itâjas*, (*viz.*) the lord of horses, the lord of elephants, and the lord of men, — (*and*) who meditates on the feet of the *Paramabhaṭṭâraka, Mahârâjâdhirâja*, and *Paramêśvara*, the illustrious **Vâmadêva**;" on the particulars of which see *ante*, Vol. XVII. p 225. Lines 5-6 state the proper object of the inscription, which, if I understand the words rightly, is to record the construction of a *vaha*,[2] or water-channel, by **Ballâladêvaka**, (or as he calls himself in line 8, the *Râuta*, the illustrious **Ballâladêva**), son of the illustrious **Kêśavâditya**, *Mahâ-râjaputra* of the village of **Vadyavâ**, — probably some official or dependant of the king Narasiṁhadêva.[3]

In line 7 the inscription is dated in the year 909, on the 5th of the bright half of Śrâvaṇa, on **Budha or Wednesday**; corresponding, as I have tried to show, *ante*, Vol. XVII. p. 217, No. 7, to **Wednesday, 2nd July, A.D. 1158.** In the same place I have stated that in A.D. 1158 Śrâvaṇa was an intercalary month, and that Wednesday, 2nd July, belonged to the first bright fortnight of the two Śrâvaṇas or the *adhika* Śrâvaṇa; and, to obviate the possible objection that this should have been indicated in the original date, I may for the present point out the date of the Dehli Siwâlik pillar inscriptions of Visaladêva,[4] of the (southern) Vikrama year 1220, as a clear and undoubted instance in which (just as is the case in the present inscription) a day of the *adhika* month is denoted by the date, though there is nothing in the wording of the date to show this. Another Chêdi date in which the *adhika* month has not been specified as such, has been already treated of by me, *ante*, Vol. XVII. p. 217, No. 9.

The village **Vadyavâ**, which is spoken of in the inscription, I am unable to identify.

TEXT.[5]

1 [Ôṁ ?][6] svasti śrî[ḥ ||[6]] Paramabhaṭṭâraka-mahârâjâdhi[r]âja-pavn(rn)mêsva(śva)ra-śrî-
2 **Vâmadêva** - pâdânudhyât(ta) - paramabhaṭṭâraka - mahârâjâdhirâja - pa[ra]-
3 mêsva(śva)ra - paramamâhêsva(śva)ra - **Trikaliṅgâdhipati** - nijabhujôpâr[jj]ita - a°-
4 sva(śva)pati[7] - gajapati - narapati - râjatry(tray) - âdhipati - [ê]riman - **Nara-**

[2] Compare *ante*, Vol. XVI. p. 206, note 33.

[3] On Râjaputra, used probably as the title of some official, see Mr Fleet's note in *Corpus Inscr. Ind.* Vol. III. p 218. Mr. Fleet suggests to me that *Mahâ-râjaputra* may denote here an official of higher rank than was held by the *Râjaputra*; and if may be pointed out that, just as in the present inscription the father, Kêśavâditya, is described as *Mahâ-râjaputra*, and the son, Ballâladêva, as *Râuta* (= *râjaputra*), so in the next inscription the father, Jâllhara, is described as *Mâha-râuka*, and the son, Chhîhula, as *Râuka*.—Sir A. Cunningham, *Archæol. Survey of India*, Vol. IX. p. 94, speaks of the 'prince Ballâladêva, the son of Kêśavâditya and grandson of Râja Narasiṁhadêva.' But it appears to me that the genitive *Vadyamê-grâmakasya* must necessarily be made dependent on *mahâ-râjaputra* as the title of an official, just as in the next inscription °*durgasya* depends on the following *mahâdhâuka*, and since we know from the inscription A. that Narasiṁha in the Chêdi year 902 was still Yuvarâja, it is extremely improbable that only seven years later a grandson of his would have been spoken of as Ballâladêva is in the present inscription.

[4] Colebrooke, *Miscellaneous Essays*, Vol. II. p. 238. This and similar dates will be treated of in a separate paper.

[5] From the rubbing.

[6] Judging from the rubbing, I am almost certain that the symbol for *Ôṁ* stands at the beginning of the line.

[7] Read °*jita*-.

[8] The whole word *asvapati* appears to have been originally omitted; and the three *aksharas svapati* are engraved before line 4, while the initial *a* has been added at the end of line 3.

5 siṁhadêva-charaṇâḥ ॥ Vadyavâ-grâmakasya mahâ-rā-
6 japutra - śrîKêsa(ṣa)vâdîya - putra - Va(ba)llâladêvakasya vahaḥ ॥[*]
7 Sa[ṁ]vat [9] 909 Srâ(śrâ)vaṇa-sudi 5 Vuddh[ê][10] ॥[*] Śrî[ḥ][11] ॥[*]
8 Râuta[12]-śrî-Va(ba)llâladêva[ḥ] ॥[*]

C.—Alha-Ghâṭ Stone-Inscription of Narasiṁhadêva.

The (Vikrama) year 1216.

This inscription,[1] together with two others, is on a block of stone which is about a hundred yards from a large cave, somewhere near the foot of the **Alha-Ghâṭ**, "one of the natural passes of the Vindhya hills by which the Tons river finds its way from the table-land of Râwah to the plain of the Ganges;" Indian Atlas, Sheet No. 89, about Lat. 24° 55′N., Long. 81° 27′E. It was discovered in 1883-84 by Sir A. Cunningham, by whom a transcript of the text, accompanied by a photolithograph, was published in *Archæol. Survey of India*, Vol. XXI. p. 115, and Plate xxviii.

The inscription contains seven lines. The **writing** covers a space of about 2′ broad by 1′ high, and is well preserved nearly throughout. The **size of the letters** is between 1½″ and 1¼″. The **characters** are Nâgarî. The **language** is ungrammatical Sanskṛit, exhibiting, *e.g.* in line 4 the form *karâpitâ*, and in line 6 *udharitaḥ*, a word which may have its origin in the vernacular and the meaning of which is not apparent. As regards **orthography**, *b* is denoted by the sign for *v*; and *j* is used for *y* in *juga*, line 3; *s* for *ś* in *Kausâmvi*, line 5; and *sh* for *kh* in *keshitaṁ*, line 6.

The object of the **inscription** is, to record (in lines 2-5) that the *Râṇaka*, the illustrious **Chîhula**, a son of the illustrious **Jâlhaṇa**, *Mahârâṇaka* of **Pipal[ôsu r]durga**, performed some meritorious deed in connection with or near the **Shaṭashaḍika Ghâṭ**, which may have consisted in the building of a road or the erection of a temple of the goddess Ambikâ, or both, but the exact details of which are not clear to me. Line 5 appears to mention some person from **Kausâmbi** who had something to do with carrying out the *Râṇaka's* orders; and lines 6 and 7 give the names of the writer of the inscription and of the artizans who were engaged in the work spoken of before.

But the really important part of the inscription are the introductory lines 1-2, from which we learn that what is stated in the sequel, took place "in the reign of victory of the illustrious **Narasiṁhadêva**,[2] the *Mahârâjâdhirâja* of **Ḍâhâla**," and which contain **the date**—"the year 1216, the first lunar day of the bright half of Bhâdrapada, on **Ravi or Sunday**." For these statements, on the one hand, give us some idea of how far the kingdom of Narasiṁhadêva extended in the north or north-east; and on the other hand, the date being clearly recorded in the Vikrama era, they enable us to test in a general way the correctness of any conclusion regarding the epoch of the Chêdi era which may be arrived at on other grounds, and they have been so used by me, *ante*, Vol. XVII. p. 218. As regards the epithet **Ḍâhâlîya** which is applied here to the king Narasiṁha, it has long been known that lexicographers give *Ḍâhala* as a synonym of *Chêdi*; and for passages in which the word is actually used in literature, I may refer to the *Vikramâṅkadêvacharita*,[3] i. vv. 102 and 103, and xviii. vv. 93 and 95, and to Professor Peterson's *Third Report on Sanskṛit MSS.*, Appendix, p. 243, l. 5, where, in an enumeration of places and countries, Ḍâhâla is placed near Kôsala.

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[9] This sign is superfluous.

[10] Read *Buddhê*; as the matter is of some importance, I may as well state that the first *akshara* and the consonants of the second *akshara* are clear in the rubbing.

[11] I believe that the *akshara śrî* of this word is quite certain.

[12] According to Sir A. Cunningham, *Archæol. Survey of India*, Vol IX. pp. 1 and 94, these words (which I give from a separate rubbing) are below the rest, appar tly separated from lines 1-7 by an empty space; but they were clearly engraved by the same artizan.

[1] *Archæol. Survey of India*, Vol XXI. p. 114, and preface, p. iv.

[2] The name is spelt *Narasiṁghadêva*.

[3] Here Karṇa, one of Narasiṁhadêva's ancestors, is described as *śrî-Ḍâhâla-kshitipariveshṭa* and *Ḍâhal-âdhîśa*, and his country is called *Ḍâhal-śrîvi*.

The date having to be referred to the Vikrama era, the possible equivalents would be :—
for the northern Vikrama year 1216, current, — Tuesday, 26th August, A.D. 1158 ;
for the northern Vikrama year 1216, expired,
or the southern current year, — **Sunday**, 16th August, A.D. 1159, when the first *tithi* of the bright half ended 1 h. 25 m. after mean sunrise ; and
for the southern Vikrama year 1216, expired, — Thursday, 4th August, A.D. 1160.

The true date therefore is **Sunday, 16th August, A.D. 1159** ; and the year 1216 of the date must accordingly be taken to be the northern expired (or southern current) year.

Of the localities mentioned in the inscription, **Kausâmbî** clearly is the village of Kôsam, of which I have spoken above, p. 137 ; and **Shaṭashaḍikâ-ghaṭa** I take to be the more ancient name of the Alha-Ghâṭ. **Pipal[ôau ?]durga** I am unable to identify.

TEXT.[4]

1 Ôṁ[5] [ll[6]] **Saṁvata(t) 1216 Bhâdra-sudi-pratipadâ Ravau ll Dâhâltya-mahârâjâ-**
2 **vi(dhi)râja-śrîNarasiṁghadêva-vijayarâjyô ll Pipal[ô]**[a ?]**-durgga[sya ?]**[7] **mahâ-**
3 **râṇaka-śrîJalhaṇa**[8]**-putra-râṇaka-śrîChchhî**[10]**hulasya Kuli-ju(yn)ga-**
4 **dharmm-ârtha[ṁ ?] Shaṭashaḍikâ-ghâṭa-[va(ba)ṁ]dhana-mârgga-ta[ṭ ?]**[10]**-Âu[v]i(mbi)kâ-**
dêva karâ-
5 **pitâ iti ll dharmm-ârtha-kâma-môkshn-sâdhana[ṁ ?] ll Kausâ(sâ)mvî(mbî)-nikâsa-**[11]**-rau-**
6 **ti[â]nâmajâti udharitaḥ ll Thakura-śrîKumalâdhara**[12] **lishi(khi)taṁ [l*]**
7 **Sûtradhâra**[13] **Kamalasiṁhaḥ Sômê l Kôkâsa ll Pâlhaṇa l [Da ?]lhaṇa ll**

D.—Karanbêl Stone-Inscription of Jayasiṁhadêva.

According to a remark in pencil on the back of the rubbing, the stone which bears this inscription[1] was found at **Karanbêl**,[2] now a heap of ruins a few miles from Bhêra-Ghâṭ, near Jabalpur in the Central Provinces ; and it was lying at the house of a stone-cutter, when the rubbing was taken. The stone is broken right through in the middle, from top to bottom, but the fracture is so clean that hardly a single *akshara* has been lost.

The inscription contains 25 lines. The writing covers a space of 3′ 6½″ broad by 1′ 7″ high, and it is well preserved throughout, so that the actual reading of the inscription is hardly anywhere doubtful. The size of the letters is about ¾″. The characters are Nâgarî, carefully drawn and skilfully engraved. The language is Sanskrit and, excepting the introductory *ôṁ namaḥ Sivâya*, the inscription is in verse. A curious grammatical mistake we meet in line 4, where the writer has formed the aorist of *kîrtayati* as *achikîrttayat* ; otherwise the inscription is remarkably free from errors, and in respect of orthography I have only to note that *b* is written by the sign for *v* everywhere except in *vajrurbhir*, line 2, *alja*, line 3, *bibhrad*, line 5, *babhâra*, line 19, and *bibhartti*, lines 23 and 24 ; that the rules of *saṁdhi* have not been observed in *sukkayan=jayanti*, line 12, and *bhuvanam=viśva*[3], line 23 ; and that for *ujjvala* we have *ujvala*, in line 16.

[4] From the rubbing. [5] Expressed by a symbol. [6] This vowel is perhaps *â*.

[7] This *akshara* is doubtful. In the rubbing it looks like *tri*, with a vertical line before it ; but I am almost certain that in the original there is a conjunct consonant, the second part of which is *y*.

[8] Perhaps altered to *na-*.

[9] In the original really *Ôhkhî*.—One would expect the instrumental case *Ôhkhulêna*.

[10] This letter is doubtful. In the rubbing it looks like *ṭ*, and the word intended may be *taka* ; but it may also be *tathâ*, or *tatra*, or *tanya*. In the following word *Âmvikâ*, the *v* of the second syllable is very indistinct, but I believe that it is there. The next *akshara*s, up to *iti*, are quite distinct. One would expect some case-termination after *dêva* ; and for the following *karâ*, *kârâ*.

[11] I give these words, up to *udharitaḥ*, as they appear in the rubbing and in the photolithograph. But the third *akshara* of *nikâsa* may really be *si*, and the whole word *nisâsa* ; and the vowel of the first *akshara* of line 6 appears to have been struck out, so that the word following upon *nisâsa* would seem to be *'rauta*, for *rauta*. For the following *akshara* I cannot suggest any suitable meaning or emendation, beyond saying that the oddly shaped *d*, the second *akshara* in line 6, may really be *tri*.

[12] Read °*dhavêna*.

[13] Here again, and in some of the following names, the case-terminations have been omitted.

[1] *Archæol. Survey of India*, Vol. IX. p. 90, No. xi. [2] *Journal Amer. Or. Soc.* Vol. VI. p. 517, note g.

Judging from the introductory verses, the inscription probably was intended to record the erection of a temple of Śiva; but it has clearly been left incomplete. For there is nothing in it to show why it was engraved; and we miss at the end the names of the author and of the engraver, which, in a carefully executed inscription like the present one, had it been finished, would hardly have been omitted. In consequence, the inscription also is left undated.

The contents of the inscription may be given in very few words. After the introductory "Ōṁ, adoration to Śiva!" and six verses invoking the blessings of Śiva, Gaṇānana, and Sarasvatī (ll. 1-4), the author relates that Prajāpati, the lord of the creatures, begat Atri, from whom proceeded the moon, whose son again was Budha; and that in the lunar family so founded, there was the famous king **Arjuna** (ll. 4-6). The family became generally known under the name of **Kalachuri**, and in it there was born the king **Yuvarājadēva**, who conquered all regions and dedicated the wealth which he took from other kings to the holy **Sōmēśvara** (ll. 6-7). He begat the king **Kōkalla**, from whom sprang **Gāṅgēyadēva** (ll. 7-10). His son again was **Karṇa**, who was waited upon by the **Chōḍa**, **Kuṅga**, **Hūṇa**, **Gauḍa**, **Gūrjara** and **Kīra** princes (ll. 10-12); and his son was **Yaśaḥkarṇa** (ll. 12-13). Yaśaḥkarṇa's son was the king **Gayakarṇa**, who married **Alhaṇadēvī**, the daughter of king **Vijayasiṁha** (the son of the king **Vairisiṁha** who was a son of the king **Haṁsapāla** in **Prāgvāṭa**) and his wife **Syāmaladēvī** (the daughter of **Udayāditya**, the king of **Dhārā**), who bore to him the two sons **Narasiṁhadēva** and **Jayasiṁhadēva** (ll. 13-17). **Narasiṁhadēva** ascended the throne after the death of his father (ll. 18-20), and was on his death succeeded by his younger brother **Jayasiṁhadēva**, who ruled the country when the inscription was composed (ll. 20-25).

It will be seen that the contents of the inscription are almost identical with those of the introductory portion of the Bhēra-Ghāṭ inscription of Alhaṇadēvī;[3] and a comparison of the two inscriptions leaves no doubt that our author knew that inscription and closely followed it, when writing his own *praśasti*. What is peculiar to our inscription, is mainly only this, that the genealogy (similarly to what is the case in the Kumbhī copper-plate inscription)[4] begins here with Yuvarājadēva, and is continued to the ruling prince Jayasiṁhadēva. As of some importance however, it may be noted that Yuvarājadēva is represented here as worshipping **Sōmēśvara**, the famous Sōmanātha in Gujarāt, a story which is told also of Lakshmaṇarāja (the son of Kēyūravarsha-Yuvarājadēva and Nōhalā) in the Bilhari inscription;[5] that Vijayasiṁha, the father-in-law of Gayakarṇa, and his ancestors, whom we know to have ruled in Mēwāḍ,[6] are described as kings of **Prāgvāṭa**, and Udayāditya as lord of **Dhārā**; and that the name of one of the peoples whose princes waited upon Karṇa, is spelt here distinctly *Kuṅga*, not *Kaṅga*, which is the reading of the published version of Alhaṇadēvī's inscription.[7] The word **Prāgvāṭa** occurs several times *e.g.* in Professor Peterson's *Third Report on Sanskrit MSS.*, Appendix, pp. 37, 40, 45, 187; but I am unable to determine whether it is only another name for Mēdapāṭa, or denotes a more extensive tract of country of which Mēwāḍ formed part. **Kuṅga** clearly is the **Koṅgu** or **Koṅgu-dēśa** of Southern India, corresponding, generally, to the present districts of Salem and Coimbatore.[8]

Considering[9] that Narasiṁhadēva was ruling in A.D. 1159, and Vijayasiṁhadēva, the son of Jayasiṁhadēva, in A.D. 1180, our inscription must have been composed between A.D. 1160 and 1180.

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[3] sb. pp. 502-8; and *Archæol. Survey of Western India*, No. 10, pp. 107-9.

[4] *Journal Bomb. As. Soc.*, Vol. XXXI. p. 116.

[5] sb. Vol. XXX. p. 330, verses 61 and 62. Dr. Hall misread verse 46, and in consequence he wrongly identified Lakshmaṇarāja with Yuvarājadēva in reality Lakshmaṇarāja, according to the Bilhari inscription, was the son of Yuvarājadēva and Nōhalā.

[6] *ante*, Vol. XVI. p. 346.—I am glad to be able to state that, in a short inscription from Udaypur in Mālava, I have at last discovered a reliable date for Udayāditya, the grandfather of Alhaṇadēvī,—Vikrama 1187 = A.D. 1130.

[7] In reality, the reading of the original inscription probably is *Kuṅga*, but the first *akshara* of the word is damaged.

[8] See, *e.g.*, *Archæol. Survey of Southern India*, List of the Antiquarian Remains in the Presidency of Madras, Vol. I. p. 183.

[9] See *ante*, Vol. XVII. p. 218.

TEXT.[10]

1 Ôṁ namaḥ Sivâya ॥ Dêvaḥ[11] sadâ samudit-âdbhuta-bhûti-saṁpat-saṁpâdayatv=abhimatasṁ bhavatâṁ sa yasya । svaḥsiṁdhu-saṁgata-jaṭô śirus=îṁdu-lêkhâ navy-âṁkura-śri[ya]m=anâratam=âtanôti ॥ Yan[12]=nityaṁ dravatiṁ vi(bi)bhartti gurutâṁ dhattô tatô=nyach=cha yad=yô cha sparśavatî gurutva-rahitê bhûtaṁ yad=asparśavat ।

2 yat-karmm=ôpahitaṁ karôti bhuvanaṁ kâl[ai]ḥ kal-ôllâsi yad-yasmin=yajña-phalaṁ vapurbbhir=avatâd=yushmân=amibhiḥ Sivaḥ ॥ Dhanyâs=tâ vahasê śirasy=avirataṁ yâsâṁ kapâ[la]-srajaṁ vaktavṛṇaṁ ta iti vra(bra)vîmy=ata idaṁ puṁstvêna saṁkîrttaya । n=aitad=yuktatamaṁ bhavên=na [cha] mayâ strîtvaṁ tyaj=êty=uchyatê tach=ch=âśakyam=iti priy-ô-

3 ttara-vidhau vyagrô Haraḥ pâtu vaḥ ॥ Bhûshâ[13] nêtraśruti-virachitâ yatra yatr=Âbjajanma[14]-vyâkôśa-śrîḥ prabhavati mudê yatra nishṭhâ prajânâṁ । mûrttâv=êva prasaraṇi rajô yatra yatr=â[st]i sâkshât=kûtasthâ dhîḥ sa diśatu sadâ Saṁbhur=abhyarthitaṁ vaḥ ॥ Yô[15] Dhârjjati-jaṭâjûta-mukutâd=aparaṁ vidhôḥ । dhattô=rddhan=daṁta-mishataḥ sa vaḥ pâyâd=Gajâna-

4 naḥ ॥ Chatur-ggatiś=chatur-vṛittiś=chaturvvargga-prayôjanâ । prapaṁchayatu châtur-yaṁ satâṁ satyaṁ Sarasvatî ॥[16]॥ Prajâpatir=abhidhyâna-prava(ba)ṁdhât=samajîjanat । atṛitlyatayâ putraṁ yam=Atrim=achikîrttayat[17] ॥ Tasmât[18]=samasta-bhuvan-âbhyuday-aika-dhâma[19] râmâ-manah-sarasa-saṁmada-keli-kaṁdaḥ । vistâra-hêtu-kiraṇaḥ kumud-âka-

5 rûpâṁ Bhûtêśa-bhûshaṇa-śirômaṇir=âvir-âsît ॥ Manasa[20] iv=âtiviśuddhâd=vô(bô)dha iv=âbhûd=Vu(bu)dhas=tasmât । bhuvan-âbhaya-kṛid=bhûbhṛid-vaṁśas=tôn=ajani sthêyân ॥ Âsît[21]=Kalânidhi-kulê=tra karân=sahasraṁ bibhrad=div=êva rajanâv=api sa-pratâpaḥ । bhûmibhṛid=Arjjuna iti prathitêna nâmnâ yasy=âdhun=âpy=abhimatâny=a-

6 bhitô bhavaṁti ॥ Tê tâdṛiśâḥ katichid=êva kalâchid=êva bhâgyair=bhavaṁti bhavinâṁ bhuvan-aika-nâthâḥ । gôtrê=tra yô samabhavann=adhik-âdhik-ôccha-saṁpattayô=dhipatayaḥ pṛithiv-îśvarâṇâṁ ॥ Asminn=avâṁtara-mahârha-viśêsha-yôgât=prâptê kulê Kalachur=êty=abhidhâ-prasiddhim । janm=âsasâda śukṛitair=ija-

7 gatâṁ Yayâti-tulyô guṇair=nnarapatir=Yuvarâjadêvaḥ ॥ Yên=ôrjjitêna jagatî-patinâ vijitya sarvvâ diśaḥ samabhihṛi[tya] nar.îśvarâṇâṁ । tâs=tâḥ śriyaḥ pa[ra]-ma-bhakti-bhara-śritâ śrî-Sômêśvarâya samupâyunam=akriyaṁta ॥ Tên=âvaniśa-patinâ bhuvan-aika-mallaḥ Kôkalla ity=ajani bha-

8 rtsita-vairi-bhallaḥ । yat-kîrttanaṁ kati na vi(bi)bhrati bhûri-śôbhâṁ=anyôṁya-vibhrama-sahasra-dharair-jjaganti ॥ Janit[22]-âtiśayita-śaktir=vva(bba)hutara-saṁdarśit-ôru-Bhava-bhaktiḥ । Himavân=iva bhuvana-bhayaṁ yô jahrê vâhinî-nivahaiḥ ॥ Tasmâd[23]=va(ba)bhûva Bhuvana-âbhyudaya-pragalbha-gâṁbhîrya-gaurava-sahô-

9 dara-śaurya-dhairyaḥ । Gâṁgêyadêva iti guptiahu yasya bhûpâ lajjâṁ jahur=Ddaśamukh-Ârjjunayôḥ kathâbhiḥ ॥ Naman[24]-nṛipa-śirôbhir=yat-pâda-padman

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[10] From the rubbing. [11] Metre, Vasantatilakâ.

[12] Metre, Śârdûlavikrîḍita; and of the next verse.—Compare Dr. Hall in *Journal Amer. Or. Soc.* Vol. VI. p. 502, verse 3, and pp. 524-25.

[13] Metre, Mandâkrântâ. [14] Originally *nmâ*, altered to *nma*.

[15] Metre, Ślôka (Anushṭubh); and of the two next verses.—Compare *ib.* p. 502, verse 5.

[16] Between these signs of punctuation there is an ornamental full stop.

[17] *achikîrttayat*, wrongly for *achikîrtat* or *achîkarat*. [18] Metre, Vasantatilakâ.

[19] Originally *md*, altered to *ma*. [20] Metre, Upajâti.

[21] Metre, Vasantatilakâ; and of the four next verses.—Compare *ib.* p. 502, verse 7.

[22] Metre, Âryâ. [23] Metre, Vasantatilakâ. [24] Metre, Ślôka (Anushṭubh).

vîrêjatuḥ | kṛipâṇa-jala-saṁjâta-jayaśrî-jalajair=iva || Vairi[31]-vikrama-niśâ diśâṁ
mukha-śrî-kuraṅgamada[32]-patravallarî | bhrû-latâ vijaya-
10 vârija-sthitêś=tasya khaḍga-latîk=âkarûna=na kim || Samutthrṇu[33]-âṛṇavâ sênâ yasy=
âjñ=êva mahîbhṛitaḥ | varuṇanîya-guṇa-grâmaḥ **Karṇṇaḥ** sa samabhût=tataḥ ||
Avimukta[34]-pâda-kaṭakaiḥ pṛithutara-hâr-âvaguṇṭhita-vikaṁthaiḥ[35] | pura iva
vipinê=py=ari-nṛipa-nârîbhir=yasya saṁtatam tasthê || Nîchaiḥ[36] sanchara
Chêḍa Kuṅga[37] ki-
11 m=idaṁ phalgu tvayâ valgyatê **Hûṇ**=aivaṁ raṇitum na yuktam=iha . tê tvaṁ
Gauḍa garvvam=tyaja | m=aivaṁ **G[u]rjjara garjja Kira** nibhṛitô varttasva
sêvâ-gatûn[38]=itthaṁ yasya mithô-virôdhi-nṛipatîn dvâ[h]sthô viniyê janaḥ ||
Anîyaṁta[39] paraṁ vṛiddhiṁ yaśaḥ-saṁvêdana-śriyaḥ | manô-vinôdanair=yasya
kavîn-
12 draiṅ=iṁdriyair=iva || Ajâyata **Yasaḥkarṇṇaḥ Karṇṇât**=Svarṇṇa-mahîbhṛitaḥ |
Trikûṭa iva kûṭastha-guṇa-ratnâkarikṛitaḥ || Namayaty[40]-ârttin=dhanushô
yasminn=ârtt-âmṛita-prâyê | va(ba)hirê sâ punar=nunati-bhûyishṭhâ vairi-
bhûpatibhiḥ || Yaśôbhir[41]=iṁdu-viśadaiḥ karmmasbhiś=ch=âtidushkaraiḥ | diśaḥ
prasâdhayâm-âsa
13 Trivikrama-vikramaḥ || Yathâ-yathaṁ sa chaturaś=chaturbhir=abhivâṁchchhi(chhi)-
tân | arthân=upâyaiḥ prathitair=nyâya-vit=pratyapadyata || Udapadyat[42]=ôdita-
mahârha-rûpayâ sahitaḥ śriyâ sakala-śuddha-maṇḍalaḥ | dhaval-âmva(mba)-
dhêr=iva tataḥ kalâ-nidhiḥ sukhayan(ī)=jaganti **Gayakarṇṇa**-bhûpatiḥ ||
Karavîla[27]-tamâla-pallavaḥ ka-
14 ra-saṁchâry=api yasya bhûpatêḥ | parimṛijya rajô=sra-vṛishṭibhiḥ parichaskâra
raṇê jaya-śriyam || Vainatêya[43]-sama-vikrama-kramaḥ kêvalaṁ sa na chakâra
pṛishṭataḥ | Achyutaṁ su-charitô na ch=âcha[ra]t=karmma kiṁchid=api
pakshapâtataḥ || Dvâparô[44]=pi na tasy=âsît=karmma-kâṇḍê kutaḥ kaliḥ ||
kṛitam=êva sad=âdr̥âkshuḥ kâryaṁ vidvêshiṇô=pi yat ||
15 **Prâgvâṭ**[45]=vanipâla-bhâla-tilakaḥ **śrî-Haṁsapâlô**=bhavat=tasmâd=bhûbhṛid=asûta[41]
satya-samitiḥ śrî-**Vairisiṁh**-âbhidhaḥ | yaj-jauma dvishatâṁ bhayâya
suhṛidâṁ=ânanda-saṁpatta[yê] śrûyaḥ-śrî-sadanâya śaurya-mahasâ viśv-ôtsavây=
âbhavat || **Vijayasiṁha**[13] iti kshitipas=tataḥ samajanishṭa vinashṭa-kaliḥ ki-
16 la | kshitibhṛid-indra-śriyaḥ-kṛita-saṁcharaḥ prahata-matta-mahâ-ripu-kuṁjaraḥ ||
Dhâr[46]-âdhîś-**Ôdayâditya-sutâ Syâmaladêvy**=abhût | vallabhâ tasya bhûpasya
Satyêv=Âsura-vidvisha[h ||] Tasyâṁ=**Alhaṇadêv**=iti kanyâ-ratnam=asûta saḥ |
Mânâyâṁ=Avanîbharttâ Gaurim=iva guṇ-ô[ṣ]jvalâṁ || Tasyâḥ sa pâṇinâ
pâṇiṁ **Gaya-**
17 **karṇṇa**-mahîpatiḥ | jagrâha jagatâṁ sthityai Sivâyâ iva Saṁkaraḥ || Ajanayad[44]=
Alhaṇadêvyâṁ Gayakarṇṇa-mahîpatis=tanujan | Saṁjnâyâṁ Divasa-patir=
Ddasrâv=iva sarvva-duḥ[khâ]-harau || **Narasiṁhadêvam**[45]=ôkaṁ chakrê
janakas=tayôr=nâmnâ | **Jayasiṁhadêvam**=aparaṁ lôkô yau Râma-Lakshmaṇau mênê || Su-kṛitaiḥ[46] svarggam=a-

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[31] Metre, Rathôddhatâ.
[32] The word *kuraṅga-mada*, 'musk' (= *kuraṅga-nâbhi*) is not found in the dictionaries.
[33] Metre, Ślôka (Anushṭubh). [34] Metre, Gîti. [35] I am unable to give the exact meaning of *vikaṁtha*.
[36] Metre, Śârdûlavikrîdita.—Compare, ab. p. 504, verse 12.
[37] This is quite distinct here; and it is not *Kuṅga*.
[38] Or, perhaps, *sêvâ gatân*. [39] Metre, Ślôka (Anushṭubh); and of the next verse.
[40] Metre, Upagîti.—*Ârtti* means both 'the end of a bow' and 'misery.'
[41] Metre, Ślôka (Anushṭubh); and of the next verse.
[42] Metre, Mañjubhâshiṇî. [27] Metre, Vaitâlîya. [43] Metre, Rathôddhatâ.
[44] Metre, Ślôka (Anushṭubh). [45] Metre, Śârdûlavikrîdita.
[41] Contrary to the usage of the later language, *asûta* is here used in a passive sense.
[42] Metre, Drutavilambita. [43] Metre, Ślôka (Anushṭubh); and of the next two verses.
[44] Metre, Upagîti. [45] Metre, Udgîti. [46] Metre, Upagîti.

18 n arggalam=udhitasthushi Śakra vaj=janakê | Narasimhadêva-nripatiḥ paryashkârshîn=mahîm=êtâm || Prasasâsa[47] mahîm mah-anujasam=apy=abhibhûshinur=N narasimhadêva bhûpaḥ | para-lôka-bhay-â[na]bhi[ṣâtiyâm=bhuvanam samâdhad=âchyut-êcha rûpaḥ || Yasmim[48]=chalati dhûlînâm paṭalas=tapanê tathâ | nibnutê=py=asi-bhûpânam samtâpaḥ paryavardidhata ||

19 Mahâdân-âdy-asûnyâni kurvvan=purvvânu=nachkanâḥ | dharmmasy=âvîvṛidhad=yô=mhi In=Va[hu]hir=Vvishnôr=iv=ôdyatah || Punânasya jagat=sarvvam nitântam timira-druhah | yat-kîrtti-vasasḥ sukrê sasu[ṣkô]=pi śuśô=bhavat || Sa tathâ sukha-sayâsu rêtrâv=atrasta-mandalah | svapatim=apy=anisam vam-hṛidayêshv=abhya-jâgarît || Śriyam babhâra vidhva-

20 d=Dânav-âtti-tôshitah | Mahêndra-vad=dvija-śrêshtha-varggas=tat-samgam=âgatah || Svarlôka[49]-nâth-âtithitâm prayatê tasmim=nripê sri Narasimhadêvô | churâya pushnâtu satâm hitâni śrîmân=mahîbhṛiy=Jayasimhadêvah || Yasy[50]=ôru ratna-nachit-âmchita-châru-sôbhâ-vismôra-bhûri-kanakasya sad=ônnatasya | bhûmîbhṛi-tâm=adhipatêḥ sura valim=ê-

21 va kîrttir=jjagantu na kiyantu punâty=anantâ || Yôna[51] prâchî-vijaya-rabhasân=nitya-matt-ôbha-kumbh-âtûdhân=pradhu-pratihta-yasasah śaurya-bhâjô=vanîndrân | kurvvâcha tridaśa-bhuvanam [ga]mmô nir-vvisamkam chakrê chittam chakita-chakitam nâkinâm nâyakasya || Yad[52]-vakta-vârija-vikâśa-vaśêna dina-vargê=pi valgati nimanta-

22 ram=êva lakshmîḥ | yad-bhrû-vibhanga-bhaya jaś=cha nar-âdhipânâm vyâdhir=una nasyati van-aushadhi-sêvay=âpi || Kiyantô[53] n=âbhûvan=bhuvi bhuvana-sam-bhâvita-gunâḥ paniyyantô yôshâm kṛiti[bhi]r=adhun=âpi sthiti-pathâḥ | aya[m] tv=anyas=tesham=api guna-gan-ôdahanatatan=badhânah śuddha-śrîr=jayatu Jayasimhah kshiti-patih || Nasya[54]

23 pratîpa-tapanah pâthiv-ôndhana êva yat | tach=chitram yach=cha kumuda-dvêshî khîti-sudhâkarah || Mitrânam[55]=upakâra-kârim sadâ sau-mârgga-samch rimi prajñ-ôtkarsha-vidhârim pragunî[nâm] tyâg aika-vistârim | śatrûnim=avirâma-sanya-vijaya-prôdyan mad-ô[chchâ]rim pitam yatra parâm bibharti bhuvana-nam(m)=visvambhrâ-dhârim ||

24 Yas[56]-chalan=dhûli pataliah payâmsi payasâm nidhêḥ | na kêvalam tirôdhattê tâjâmsy=api vibhâvasôḥ || Pramânân=iva chatvâri sên-âṅgâny=adhitishthatâ | yêna nyaya-pravîcina paradsim [kha]udyatê sthitih || Na mumchati kad=apy=asya jaya-śrîḥ karu-pushkaram | bibharti rana-vâdyêshu tâmjav-âdamva-(mba)ram param || Srutvâ[57] sri-Jayasimhadê-

25 va-nripatêḥ karmim=âtrasmâpakam Parthasy=êva param=amuchyata nripaḥ pûrvvam yuyutsâ-rasah | sîḥ paschât=sa-rasâ tatas=cha nagarî putrâḥ kalatram=tatas=tasah kêvalam=adri-gahvara-ga[tai]r=nu=angîkṛitas=tyajyatê ||

E.—Gôpâlpur Stone-Inscription of Vijayasimhadêva.

This inscription was discovered in 1862 by Dr F. E. Hall at the village of Gôpâlpur, about two miles to the south of Bhêra-Ghât, where it is said to have been brought from Karanbêl, and it has been previously noticed in the *Journal Beng. As. Soc.* Vol XXXI. p. 113, and in *Archæol. Survey of India*, Vol IX. p. 99, No. xv. In an attempt to remove it, the stone on which the inscription is was broken right through from top to bottom.

The inscription contains 21 lines. The writing covers a space of 4′ 5″ broad by 1′ 9½″ high. The larger portion of it, on the proper left part of the stone, is in a fair state of preservation;

[47] Metre, Anupachchhandasika.
[48] Metre, Śloka (Anushtubh), and of the next *four* verses
[49] Metre, Upajâti.
[50] Metre, Vasantatilakâ
[51] Metre, Mandâkrântâ.
[52] Metre, Vasantatilakâ
[53] Metre, Śikharinî
[54] Metre Śloka (Anushtubh).
[55] Metre, Śloka (Anushtubh), and of the next two verses.
[56] Metre, Śârdûlavikrîḍita.
[57] Metre, Śârdûlavikrîḍita.

and on the smaller right part the upper five or six and the concluding three or four lines, and generally about eight or ten *akshara*s at the commencement of each line, are sufficiently well preserved to be made out from a careful impression. The size of the letters is about $\frac{3}{8}$". The characters are Nâgarî. The language is Sanskrit, and excepting the *ôṁ namô bhagavatê Vâsudêvâya* at the commencement of line 1, and the words *śrî-Sômarâja-kritaḥ râjâvalî-varṇṇanam=iti* in line 16, the inscription is in verse.

The inscription contains no date. Its object is to record (in lines 16-21, in which the names of the private individuals Malhaṇa, Jôgalâ, Harigaṇa and Mahâdêvî occur), the erection, by a member of the Kaśyapa family, of a temple of Vishṇu; and by way of introduction it gives an account of the Kalachuri kings, from Karṇadêva, as it appears, to the ruling prince Vijayasiṁhadêva. In this introductory part I notice the following names:—line 6, Sahasrârjjuna; line 7, Kalachuri-kula; line 9, Karṇadêva; line 11, śrî-Yaśaḥkarṇadêva; line 13, śrî-Gayâkarṇadêva; at the beginning of line 15, śrî-Narasiṁhadêva; in the second half of the same line, — rarâja râja-vraja-Dharmmarâjas=tasy=ânujaḥ śrî-Jayasiṁhadêvaḥ; at the beginning of line 16, śrîmad-Gôsaladêvî; and in the same line, in the verse following immediately upon the verse which speaks of Gôsaladêvî, — jayati tad-aṅga-sujanmâ śûraḥ śrî-Vijayasiṁhadêva-nṛipaḥ. From this I have no doubt whatever that Gôsaladêvî is represented here as the wife of Jayasiṁhadêva and mother of Vijayasiṁhadêva, and that she was not (as has been erroneously inferred from the Kumbhî copper-plate inscription[1]) the wife of Vijayasiṁhadêva.

Since for Vijayasiṁhadêva we have the dates[2] A.D. 1180 and 1195, the inscription must be referred to about the last quarter of the 12th century A.D.

MISCELLANEA.

CORPUS INSCRIPTIONUM INDICARUM, VOL. III.

Owing to the friendly suggestions of Professor Kielhorn, I am able to notify the following improvements in my treatment of some of the records published by me in *Corpus Inscriptionum Indicarum*, Vol. III., "the Gupta Inscriptions."

Indôr Grant of Skandagupta.

No. 16, Plate ix. B., p. 68 ff. — In line 1, notwithstanding the analogous instance of *dyata-sti* quoted in note 3, the word *êka-lina-sti* is an impossible word. For the proper interpretation of the text, we must correct *stuvaḥ* into *stuvaḥ*; and take *dhyâ-aikatâni* as a nominative plural, the final *visarga* of which has been omitted before the following initial *st*, (in accordance with the Vârttika on Pâṇini, viii. 3, 36). The translation will thus be — "May that Sun, the rich source of rays that pierce (*the darknesses which is*) the envelope of the earth, protect you,—whom we Brâhmaṇs, of enlightened minds, praise according to due rite, having (*our*) thoughts entirely concentrated in meditation (*on him*)," &c.

Mandasôr Pillar Inscription of Yaśôdharman.

No. 33, Plate xxi. B., p. 142 ff.; and *ante*, Vol. XV. p. 253 ff. — The verse in line 3 may be better translated thus: — "He in whom, possessed of a wealth of virtue, (*and so*) falling but little short of Manu and Bharata and Alarka and Mândhâtṛi, the title of 'universal sovereign,' — which, in this age that is the ravisher of good behaviour, applied with a mere imaginary meaning to other kings, of reprehensible conduct, has not shone at all, (*being in their case*) like an offering of flowers (*placed*) in the dust,— shines even more (*than it ordinarily does*), like a resplendent jewel (*set*) in good gold."

And in the verse in line 6, the force and importance of the reference to Mihirakula may be much heightened by taking the construction differently and translating thus: — "He (Yaśôdharman) to whose two feet respect was paid, with complimentary presents of the flowers from the lock of hair on the top of (*his*) head, by even that (*famous*) king Mihirakula, whose head had never (*previously*) been brought into the humility of obeisance to any other save (the god) Sthâṇu, (*and*) embraced by whose arms the mountain of snow falsely prides itself on being styled an inaccessible fortress, (*and*) whose forehead was pained through being (*now for the first time*) bent low down by the strength of (*his*) arm in (*the act of compelling*) obeisance."

The verse, thus taken, contains a double and very emphatic statement that Mihirakula had never

[1] *Journal Beng. As. Soc.* Vol. XXXI. p. 115.

[2] *ante*, Vol. XVII. p. 218.

been subdued by any other king, but was conquered by Yaśôdharman; and also an indication that Mihirakula exercised sovereignty in the region of the Himâlaya mountains.

Note 4, on p. 148, is to be cancelled.

Mandasôr Inscription of Yaśôdharman and Vishṇuvardhana.

No. 35, Plate xxii., p. 150 ff.; and *ante*, Vol. XV. p. 222 ff. — In line 16, for *chi[nva ?]n*, read *vi[ghna]n*: — "Abhayadatta, maintaining a high position, (*and*) preventing any fear on the part of (*his*) subjects." The word *dharittrydm*, in line 15, is to be construed with *adṛishṭam*; not with *daṇḍânaḥ*.

Rajim Grant of Tivaradêva.

No. 81, Plate xlv., p. 291 ff. — In my list of Errata at the end of the volume, I have already stated that in line 1 the reading of the original is *stambha[h*]*, not *sâtra[h*]*. And it seems better not to turn *jagat-traya-tilaka* into a separate word by inserting a *visarga*, but to take it in composition with *kshitibhṛit-kula-bhavana*. The translation will thus be — "Victorious is the illustrious Tivaradêva, the auspicious pillar (*for the support*) of the palace that is a family of kings which is the ornament of the three worlds," &c.

The first thirteen lines of this record presented several points of difficulty, some of which have now been made clear. Thus —

In line 4, *pâtita*, 'struck down,' which is the reading of the original, must be treated as a mistake for *pâṭita*, 'split open;' and it qualifies *kumbha*, 'the foreheads or frontal globes of the elephants,' not the elephants themselves; in the *Vâsavadattâ*, p. 42, *jarjarita*, 'torn open,' occurs in an analogous passage. Also, in line 5, for *sad-śikta*, read *saṭâ-śikta*; — "pearls that are besprinkled with the copious streams of blood trickling down from the round foreheads of the elephants of (*his*) enemies which are split open by the crushing blows of (*his*) sharp sword."

In line 8, for *kuṅkumapatra-bhaṅgat*, read *kuṅkumu-patrabhaṅgat(h)*; and translate — "who wipes away the collyrium below the eyes of the wives of (*his*) enemies, and the decorative lines drawn with saffron on (*their*) tender cheeks."

In line 10, for *gâ la(ḍha)-svachchha-praśanna*, &c., read *gâḍa(ḍhaḥ) svachchha[h*] praśanna*, &c.; and, construing the six adjectives commencing in this line with the six locatives commencing in line 9, translate, — "who, moreover, is worshipped by mankind in (*respect of his*) penance, performed in a former existence, because it was so severe that the effects of it have not yet been fully expended; who is never satisfied in (*the accumulation of*) fame; who is reserved in the matter of keeping secrets; who is very keen in (*his*) faculty of reasoning; who is pure in sight; and who, in (*beauty of*) form, is decorated with a complacent countenance." Here, the *prâktanaṁ tapas* is indicated as *aklishṭam*, 'not yet expended;' *klishṭaṁ tapas* would be analogous to *klishṭaṁ puṇyam*, which expression occurs in the *Abhijñâna-Śâkuntala*, Act 6.

In line 11, *ku-ṛishṇa* cannot properly be taken as an adjective by itself. We must treat the *visarga* of *anujjhitaḥ* as a mistake, and read *anujjhita-kuṛishṇâ-pi*: — "who, though he has not abandoned the desire for (*conquering or acquiring*) land, is yet exceedingly liberal (*in granting lands to gods and Brâhmans*)."

In line 12, the *visarga* of *aparushaḥ* must be treated as a mistake, and we should read *aparusha-svabhâva[h*]*, — "who, though he is adorned with majesty, is yet of a disposition that is not harsh." The contrast here is that the king, though, like the god Śiva, he is adorned with *bhûtî* ('majesty,' as applied to the king; 'ashes,' as applied to the god), is yet, differing from Śiva, of a gentle disposition.

In line 13, for *dharm-ârjanâna sampal-lâbhâ svalpa-krôdhêna prabhâvô*, read *dharm-ârjanâ na sampal-lâbhô svalpa[h*] krôdhô na prabhâvô*; and translate — "who is never quite satisfied in accumulating religion, (*though such is*) not (*the case*) in respect of the acquisition of wealth; who is insignificant as regards anger (*i. e.* who shews but little anger), (*but*) not as regards majesty."

In line 14, for *sa(śa)k[i]aḥ*, read *saṅk[i]aḥ*: — "who is fond of excellent conversations, (*but*) is not addicted to dallying with wanton women."

In this inscription, there are still two passages that require further consideration. One is in line 3, where Prof. Kielhorn is of opinion that, for *kaṇṭhad-unmukha*, it might be better to read *kaṇṭh[d*]d=unmukha*; the idea being that the goddess of the fortunes of the hostile kings clinge to their necks, and that Tivaradêva drags her away by her hair from that position. But then the detached ablative would occupy a rather anomalous position with respect to *dharshaṇa*, by which it must be governed.

The other passage is in line 11, where I have read *svâmi-bhavan[d*]=py-a-bahu-lapanô*. Since *anujjhitah* is to be corrected into *anujjhita*, and taken in composition with *kuṛishṇô*, we require before *api*, not a locative, but an epithet of which the contrast is provided by the compound following *api*. Prof. Kielhorn is inclined to read *svâmi-(mâ)-bhavan[n*] (or *svâmi(mî) bhavan[n*])=apy=a-bahula-paṇḍô*: — "who, lord or possessor of much property though he is, yet is not much

addicted to gambling;" where the contrast would be furnished by the other meaning of *a-bahula-pana*, 'not possessed of much coin.' Accepting the first correction, but maintaining *lapana*, 'the act of speaking, talking,' I feel more inclined to prefer — "who, lord though he is, yet does not indulge in (*too*) much (*needless*) talking."

Miscellaneous.

P. 138, note 2, on the word *bhâmichchhidra*. For *krishya-yôgyâ bhûmi &c.*, read *krishy-ayôgyâ bhûmi*, 'land not fit for cultivation.'

6th March, 1889. J. F. FLEET.

A NEW SYSTEM OF THE SIXTY-YEAR CYCLE OF JUPITER.

On the Sixty-Year Cycle of Jupiter, a valuable paper by Prof. Kielhorn, with Tables for calculation, is given at page 193ff. above. And I hope that hereafter we shall have a full historical account of it from Mr. Sh. B. Dikshit. Meanwhile, for my present purpose, I have to note that the following three varieties of this cycle are already known: —

(1) The true astronomical system, usually called the northern system, but, — since, in early times, it was current in Southern, quite as much as in Northern, India, — more appropriately named by Mr. Sh. B. Dikshit[1] the mean-sign system. According to this, the commencement of each *saṁvatsara* is determined by the passage of Jupiter among the signs of the zodiac; and, on the exact analogy of expunged *tithis*, on certain occasions a *saṁvatsara* is expunged, or, more properly, for the purposes of the civil reckoning its name is omitted, though astronomically the period of the *saṁvatsara* remains extant.

For modern times, an instance of this, coupled with an illustration of (3) below, is furnished by the Gwâlior almanac for Śaka-Saṁvat (1808 expired and) 1809 current, and northern Vikrama-Saṁvat (1943 expired and) 1944 current;[2] which, following in this respect the practice of Southern India, gives Vyaya, No. 20, as the name, according to the *chândra-mâna* or lunar reckoning, of the luni-solar period from the 5th April, A.D. 1886 (Chaitra śukla 1), to the 24th March, A.D. 1887 (*amânta* Phâlguna, or *pûrṇimânta* Chaitra, krishṇa 15); but adds that, according to the *bârhaspatya-mâna* or reckoning of Jupiter, in documents the name of Vilambin, No. 32, is to be used from a certain time on Âśvina krishṇa 7, Friday, in the preceding year, corresponding to the 30th October, A.D. 1885, up to a certain time on Âśvina krishṇa 14, Tuesday, of the current year, corresponding to the 26th October, A.D. 1886, and, after that time, the name of Vikârin, No. 33.

(2) A development of this system in Northern India, which would best be named the northern luni-solar system. According to this, each *saṁvatsara* extends over the same period with a Śaka or a northern Vikrama year, commencing, for the civil reckoning, with Chaitra śukla 1; and every eighty-sixth *saṁvatsara*, or nearly so, is actually expunged or passed over altogether.

An instance of this, coupled with the next system, is furnished by the *Sâyana-Pañchâṅg* for Śaka-Saṁvat (1808 expired and) 1809 current,[3] and northern Vikrama-Saṁvat (1943 expired and) 1944 current; which tells us that the same luni-solar period, from the 5th April, A.D. 1886, to the 24th March, A.D. 1887, is known, on the south side of the Narmadâ, by the name of Vyaya, No. 20, and, on the north side of that river, by the name of Vilambin, No. 32.

And the real rule for it must be, that, whatever *saṁvatsara* is actually current according to the mean-sign system at the commencement of a Śaka year, that *saṁvatsara* is to be taken as coincident with the whole Śaka year, and with the entire Vikrama year which, at some period still to be determined, came to be made identical in Northern India with the Śaka year.

The time at which this system was developed and brought into use, remains to be determined. When it can be fixed, we shall probably find that the system started with a year in which two at least of the following conditions occurred on one and the same day; *viz.* the ending of Chaitra śukla 1, as the beginning of the civil luni-solar year; the Mêsha-Saṁkrânti, as the beginning of the solar year; and the commencement of a *saṁvatsara* by the mean-sign system.

(3) The so-called southern system, which would best be named the southern luni-solar system, and which must be the South-Indian development of the original mean-sign system. According to this, each *saṁvatsara* extends over the same period with a Śaka year, commencing, for the civil reckoning, with Chaitra śukla 1; and the *saṁvatsaras* run on in regular unbroken succession, without any expunctions.

An instance of this, in addition to that noted under (2) above, is furnished by the *Siddhânta-Pañchâṅgam* for Śaka-Saṁvat (1808 expired and) 1809 current, and the *Telugu Calendar* for Śaka-Saṁvat 1809 current;[4] which give Vyaya,

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[1] See *ante*, Vol. XVII. p. 2.

[2] See *ante*, Vol. XVII. p. 206.

[3] See *ante*, Vol. XVII. p. 207, and note 10.

[4] See *ante*, Vol. XVII. p. 207.

No. 20, as the name of the same luni-solar period from the 5th April, A.D 1886, to the 24th March, A D. 1887.

The exact time at which this system was developed and introduced remains to be determined. But apparently we have to look for it between[5] A.D. 804 and 806 And the invention of the system was probably due to a similar coincidence of occurrances with that suggested under (2) above.

In addition to these, there would appear to be another system, which is really fitted to the Śaka years, but curiously enough is mentioned only in connection with the southern Vikrama years; and which might, therefore, for convenience in distinction, be named the southern Vikrama luni-solar system, provided it is borne in mind that the *saṁvatsaras* do not coincide with the southern Vikrama years. This system does not seem to have been previously noticed; and my attention has been drawn to it by a further examination of Ganpat Krishnaji's and K L. Chhatre's almanacs

Their almanacs for Śaka-Saṁvat (1808 expired and) 1809 current,[6] and southern Vikrama-Saṁvat (1192-93 expired and) 1493-94 current, give Vyaya, No. 20, as the name of the luni-solar period from the 5th April, A D. 1886, to the 24th March, A.D. 1887, as equivalent to the Śaka year; following, in this respect, system (3) above, the standard system of Southern India. But they treat the Vikrama year differently. Thus, southern Vikrama-Saṁvat 1943 current commenced, in the preceding Śaka year, on the 7th November, A.D. 1885 (Kārttika śukla 1), and ended, in the current Śaka year, on the 27th October, A.D 1886 (*amānta* Āśvina krishṇa 15); and southern Vikrama-Saṁvat 1944 current commenced, in the current Śaka year, on the 28th October, A D. 1886, and ended, in the following Śaka year, on the 16th October, A D 1887. On the title-page of Ganpat Krishnaji's almanac, we have simply "in Śaka 1808 (*expired*), in the *saṁvatsara* named Vyaya." But, on the title-page of K. L. Chhatre's almanac, we have "in Śaka 1808 (*expired*), in the *saṁvatsara* named Vyaya; (in) the (*Vikrama*) year 1942 (*expired*) and 1943 (*expired*), in the *saṁvatsara* named Hēmalamba; A D. 1886 and 1887." In the *saṁvat-sara-phala* we have, in both almanacs, "in the year 1942 expired from the time of the glorious king Vikramārka, (*and*) in the Hēmalamba *saṁvatsara*; so also in the Śaka (*year*) 1808 (*expired*) of the glorious king Śālivāhana, (*and*) in the Vyaya *saṁvatsara*; in this year, the king (is) the Moon." And in the *saṁkrānti-phala* we learn that the Makara-Saṁkrānti, as the commencement of the *uttarāyaṇa* or period during which the sun is moving from south to north, should take place, according to Ganpat Krishnaji's almanac, at 38 *ghaṭis*, 44 *palas*, after sunrise on Pausha krishṇa 3, corresponding to the 12th January, A.D 1887, and, according to K. L. Chhatre's almanac, at 47 *ghaṭis*, 20 *palas*, after sunrise on Pausha śukla 13, corresponding to the 8th January, A D. 1887, "in the year 1943 expired from the time of the glorious king Vikramārka, (*and*) in the Hēmalamba *saṁvatsara*; and also in the Śaka (*year*) 1808 (*expired*) of the glorious king Śālivāhana, (*and*) in the Vyaya *saṁvatsara*." Here we find that in each instance the name of Vyaya, No. 20, is coupled with the Śaka year; but the name of Hēmalamba, No. 31, is coupled, in the *saṁvatsara-phala* with southern Vikrama-Saṁvat (1942 expired and) 1943 current, and in the *saṁkrānti-phala* with (1943 expired and) 1944 current And the names of the *saṁvatsaras* are given in precisely the same way, and in unbroken succession, in the preceding almanacs, back to that for Śaka-Saṁvat (1799 expired and) 1800 current and southern Vikrama-Saṁvat (1933-34 expired and) 1934-35 current. The accompanying Table, arranged for current Śaka and Vikrama years, shows how the *saṁvatsaras* run, for these ten years, according to the two southern systems followed in these almanacs, and according to the northern luni-solar system And it will be seen that, by this southern Vikrama luni-solar system, the *saṁvatsaras* come just one year later than by the northern luni-solar system.

Now, that the *saṁvatsaras* connected in these almanacs with the southern Vikrama years, are not solar periods, commencing either with the Makara-Saṁkrānti as the commencement of the *uttarāyaṇa*, or with the Tulā-Saṁkrānti or autumnal equinox, as the commencement of the solar month Kārttika and the astronomical commencement of the southern Vikrama year as a solar year (if such a year was ever required), nor luni-solar periods commencing with Kārttika śukla 1 as the civil commencement of the southern Vikrama year, can easily be shown. Taking Ganpat Krishnaji's details, — (in Śaka-Saṁvat 1809 and) southern Vikrama-Saṁvat 1944, both current, the Makara-Saṁkrānti occurred on Pausha krishṇa 3, corresponding to the 12th January, A.D. 1887, for which day the *saṁvatsara* is specified as Hēmalamba, No. 31; the Tulā-Saṁkrānti occurred on Āśvina krishṇa 2, corresponding to the 15th October, A. D. 1886; and Kārttika śukla 1 ended on

[5] See the results for Dates Nos. 9 and 10, *ante*, Vol. XVII. pp. 141, 142.

[6] See *ante*, Vol. XVII. p. 206.

Luni-solar Saṁvatsaras of the Sixty-Year Cycle, with current Śaka and Vikrama years.

	NORTHERN INDIA.			SOUTHERN INDIA.			
	Northern Luni-solar System.			Southern Luni-solar System.		Southern Vikrama Luni-solar System.	
A. D.	Śaka.	Vikrama.	Saṁvatsara.	Śaka.	Saṁvatsara.	Vikrama.	Saṁvatsara.
1877–78	1800 ...	1935 ...	Virôdhin, 23 ...	1800 ...	Īśvara, 11.....	1934 / 1935	Sarvadhârin, 22
1878–79	1801 ...	1936 ...	Vikṛiti, 24	1801 ...	Bahudhânya, 12.	1935 / 1936	Virôdhin, 23
1879–80	1802 ...	1937 ...	Khara, 25.....	1802 ...	Pramâthin, 13 ...	1936 / 1937	Vikṛiti, 24
1880–81	1803 ...	1938 ...	Nandana, 26 ...	1803 ...	Vikrama, 14.....	1937 / 1938	Khara, 25
1881–82	1804 ...	1939 ...	Vijaya, 27	1804 ...	Vṛisha, 15	1938 / 1939	Nandana, 26
1882–83	1805 ...	1940 ...	Jaya, 28	1805 ...	Chitrabhânu, 16.	1939 / 1940	Vijaya, 27
1883–84	1806 ...	1941 ...	Manmatha, 29...	1806 ...	Subhânu, 17.....	1940 / 1941	Jaya, 28
1884–85	1807 ...	1942 ...	Durmukha, 30 ..	1807 ...	Târuṇa, 18	1941 / 1942	Manmatha, 29
1885–86	1808 ...	1943 ...	Hêmalamba, 31 .	1808 ...	Pârthiva, 19.....	1942 / 1943	Durmukha, 30
1886–87	1809 ...	1944 ...	Vilambin, 32 ...	1809 ...	Vyaya, 20.....	1943 / 1944	Hêmalamba, 31

the 28th October, A.D. 1886. And in the preceding year, the Makara-Saṁkrânti occurred on Pausha śukla 7, corresponding to the 12th January, A.D 1886, for which day the *saṁvatsara* is specified as Durmukha, No. 30; the Tulâ-Saṁkrânti occurred on Âśvina śukla 7, corresponding to the 15th October, A.D. 1885; and Kârttika śukla 1 ended on the 7th November, A D. 1885. If Durmukha, No. 30, extended either from the 15th October, A.D. 1885, to the 14th October, A.D. 1886, or from the 7th November, A.D. 1885, to the 27th October, A.D. 1886, or from the 12th January, A.D. 1886, to the 11th January, A.D. 1887, then it, and not Hêmalamba No. 31, would have to be quoted as the *saṁvatsara* current on the day, viz. Chaitra śukla 1, corresponding to the 5th April, A.D. 1886, when "the king was the Moon."

Since Hêmalamba, No. 31, was current on Chaitra śukla 1 (5th April, A.D. 1886), and Durmukha, No. 30, was current on the preceding Pausha śukla 7 (12th January, A.D. 1886), and since between these two dates there is no occurrence that could suitably be selected for the commencement of a *saṁvatsara*, — for the reason that the Mêsha-Saṁkrânti or vernal equinox did not occur till Chaitra śukla 8 (12th April, A.D. 1886), — it is evident that Chaitra śukla 1 was the actual commencement of Hêmalamba. Accordingly, it is plain that the samvatsaras of this system, though quoted with the southern Vikrama years, are really fitted to the Śaka years. And Hêmalamba, No. 31, was therefore coincident with Śaka-Saṁvat 1809 current, and extended from the 5th April, A D. 1886, to the 24th March, A.D. 1887; and it included the last seven lunar months, from the 5th April to the 27th October A.D 1886 (Chaitra śukla 1 to Âśvina kṛishṇa 15), of southern Vikrama-Saṁvat 1943 current, and the first five lunar months, from the 28th October, A.D 1886, to the 24th March, A D. 1887 (Kârttika śukla 1 to Phâlguna kṛishṇa 15), of southern Vikrama-Saṁvat 1944 current; and so with the preceding *saṁvatsaras* given in the Table.

The period to which this system can be carried back, its origin, and the reason for which its *saṁvatsaras* come just one year later than by the northern luni-solar system, remain to be determined. It can hardly be connected with the divergence in the Vikrama reckoning, unless a current Vikrama year was deliberately turned, in Northern India, at some time or another, into an expired year.

But of course the fact of its real existence remains to be established. And I take this opportunity of bringing the matter forward, as one that calls for inquiry, because the almanacs in question apparently do indicate the existence of such a system, at least now; and because I find that its existence in former times would explain some dates, for which correct results seemingly cannot otherwise be obtained.

J. F. FLEET

ONOMATOPOEIA IN HINDUSTANI.

Onomatopoetic expressions in Hindustânî are very common: here are a few which may be of interest.

1. *Billî ghur-ghurâtî hai: mâ-mâ kartî hai.*
   The cat purrs: mews.
2. *Bhêṛê mamiâtî hai.*
   The sheep bleats.
3. *Gâê hunkârtî hai.*
   The cow lows.
4. *Ghôṛâ hinhinâtâ hai.*
   The horse neighs.
5. *Gadhê rêṅgtâ hai.*
   The ass brays.
6. *Chuhê chîû-chû kartâ hai.*
   The rat squeaks.
7. *Sûar kûkhtâ hai.*
   The hog grunts.
8. *Shêr bahar gônjtâ hai.*
   The lion roars.
9. *Rîchh ghurâtâ hai.*
   The bear growls.
10. *Kuttâ bhaunktâ hai.*
    The dog barks.
11. *Hâthî chiṅghârtâ hai.*
    The elephant trumpets.
12. *Bail dakârtâ hai.*
    The bull bellows.
13. *Sâmp phunkârtâ hai.*
    The snake hisses.
14. *Mêndak turm-turm kartâ hai.*
    The frog croaks.
15. *Gîdar bhaunktâ hai.*
    The jackal howls.
16. *Murghâ bang dêtâ hai.*
    The cock crows.
17. *Murghî karkardtî hai.*
    The hen cackles.
18. *Ullû hâ-hâ kartâ hai.*
    The owl hoots.
19. *Chiriâ chîu-chîu kartî hai.*
    The sparrow chirps.
20. *Shahad-makhî bhinbhinâtî hai.*
    The bee hums.
21. *Kauvâ kâu-kâu kartâ hai.*
    The crow caws.
22. *Koilê chitakhtê hain.*
    The coals crackle.

Ambâlâ. J. G. DELMERICK.